E-164

EXTENSION CLASSES 1968-69

The
George Brown College
of Applied Arts and Technology
21 NASSAU STREET, TORONTO 2B, ONTARIO

E-164

EXTENSION CLASSES 1968-69

The
George Brown College
of Applied Arts
and Technology

21 NASSAU STREET
TORONTO, 2B. ONTARIO

TABLE OF CONTENTS

General Information	3
Academic Studies	5
Architectural Technology	9
Electrical/Electronic Technology	21
Food Technology	29
Applied Arts	32
Commercial	35
Graphic Arts	36
Engineering Technology	37
Marine Technology	42
Advanced Technical Evening Courses	45

GENERAL INFORMATION

EVENING CLASSES will be offered in the subjects listed on the following pages from September 30, 1968 to February 27, 1969. The first term begins on Monday, September 30, 1968 and ends on Thursday, December 19, 1968. The second term begins on Monday, January 6, 1969 and ends February 27, 1969.

Unless otherwise stated, courses will be offered one evening per week for 20 weeks. Each session is 3 hours in length for a total of 60 hours (instruction and examination). All courses will be conducted between the hours of 7:00 p.m. and 10:00 p.m. Classes are not held on statutory holidays. Extra classes will be started in January of 1969 and April 1969.

REGISTRATION

In person at the George Brown College of Applied Arts and Technology on Monday, September 23, Tuesday, September 24 and Wednesday, September 25, between the hours of 7:30 p.m. and 9:30 p.m. at each of the three campuses.

Campus A – 21 Nassau Street
Campus B — 37 Dartnell Avenue
Campus C – 51 Teraulay Street

All subjects indicate the Campus that will conduct the course.

FEES

Unless otherwise stated the fee for each course is $26.00 (of 60 hours duration). 30 hour courses are $15.00, 90 hour courses are $40.00, 120 hour courses are $50.00.

This amount includes the $5.00 registration fee and in some cases includes the cost of supplies. Fees *must* be paid in cash or by money order or certified cheque.

Lab. Fees — In certain courses a minimum lab. fee will be assessed. This will be paid by the students participating in the course where this fee is applicable.

IDENTIFICATION

Your receipt is your admit-to-lecture identification and must be shown to the instructor at the beginning of the course and whenever requested. No receipt is an indication of non-registration.

REFUNDS

The Registrar must be notified in writing of a student's withdrawal. Forms are available at the office for this purpose.

Refunds will be made only if requested *before* the third scheduled lecture. Allowances cannot be made for a change of personal plans or for additional commitments which a student may accept after registering for a course.

In computing the amount of the refund, a charge will be made of $2.00 per scheduled session calculated on a pro-rata basis up to the date of application for a refund, regardless of whether or not the student attended classes. The $5.00 registration fee is not refundable.

If a course is cancelled, full refund will be made.

REQUESTS FOR REFUNDS MUST BE ACCOMPANIED BY THE OFFICIAL RECEIPT (White Copy).

PARKING

Parking is not available on college property. Some public parking is available at nearby lots.

PREREQUISITES

Candidates should be advised that many of the following courses require considerable related experience. The prerequisites for any given course is a minimum requirement.

MINIMUM ENROLMENTS

The college reserves the right to cancel any class for which attendance has dropped below the required minimum and to suspend or combine during the session any classes in which attendance falls below the minimum. Where classes are suspended, a full refund will be issued.

Although it is proposed to adhere to the program as outlined in the calendar, courses and hours of instruction are subject to revision without prior notice.

TEXTBOOKS AND SUPPLIES

Textbooks and supplies for all Extension Courses may be purchased at the George Brown Bookstore: Campus A — third floor of Building number 3. Campus B — second floor at 37 Dartnell Avenue. Campus C — location to be announced.

SCHOOL CERTIFICATES

Certificates are awarded to all students successfully completing evening courses at the George Brown College of Applied Arts and Technology.

Final grades are based on a combination of term work and the final examination with term work counting for a minimum of 40% of the final mark.

A minimum of 80% attendance is required before certification may be granted in subjects involving practical shop or laboratory work.

SPECIAL COURSES

Special courses may be offered from time to time at the request of individuals or organizations if an adequate enrolment is assured.

ACADEMIC STUDIES

Prerequisites — Candidates should be advised that many of the courses require considerable related experience. The prerequisites for any given course is a minimum.

TRADE MATHEMATICS Part 1 — C110 (M133)

This course is designed for tradesmen, apprentices and persons desiring a course in trade mathematics.

Course Content — whole numbers, fractions and decimals, easy percentages, simple interest, loans, financing, discounts, trade problems in linear measure, area and volume, elementary algebraic process, solution of equations and simple formulae, principle of the slide rule and elementary operations.

Monday — 7:00 p.m. to 10.00 p.m. 60 hrs. Campus A.

TRADE MATHEMATICS Part 2 — C111 (M130 or M136)

Prerequisite — Trade Math, Part 1, or equivalent.

Course Content — Review of arithmetic processes with trade applications, review of algebraic process to simple equations and transposition of formulae, factors, powers, roots, surds, indices and logarithms, simultaneous and quadratic equations, geometry — simple constructions, deductive, geometry of the circle, trigonometry, solution of angles of any magnitude, sine and cosine rules, solution of any triangle.

Wednesday — 7:00 p.m. to 10.00 p.m. 60 hrs. Campus A.

SUPERVISION IN INDUSTRY — C120 (SPECIAL)

Prerequisite — Employment as foreman or in some other supervisory capacity.

Course Content — The role of the supervisor, leadership, responsibility for personnel, fringe benefits, technical knowledge, planning and scheduling, quality control, cost control, inventory control, methods improvement, wage incentives, job evaluation, industrial organizations, Labour Relations Act, Basic psychology standardized tests.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ADVERTISING — C102 (SPECIAL)

An orientation course looking at advertising from the marketing, communications and consumer viewpoints. Stress should be placed on:

(1) What advertising is, the position of advertising in our society, the psychology behind advertising.

(2) Advertising as it exists in the framework of both marketing and communications.

(3) A comprehensive study of the various types of media.

(4) Advertising planning and management.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

SALESMANSHIP — C103 (SPECIAL)

Covers the theory and practice of effective selling. A course should be designed to familiarize the student with the factors necessary for the development of basic persuasive abilities which are necessary in selling as *well* as in other fields.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

C. MARKETING — C107 (SPECIAL)

Examination of the principal marketing instructions: agent middlemen, wholesalers, retailers, co-operatives, consumer research agencies. Intensive study, using case histories of the more important marketing functions: selecting trade channels, packaging, branding, pricing, personal selling, product planning with special emphasis on the integration of these activities.

Wednesday — 7 p.m. to 10:00 p.m. 60 hrs. Campus A.

ENGLISH TECHNICAL C108 (ENGLISH 130 I)

PART I

This course is intended for the tradesman who wishes to improve his knowledge and command of the English language and is related to trade and business English. The work covered will be equivalent to the work covered by an apprentice proceeding to journeyman status.

Vocabulary of Trades — spelling, pronunciation and definition of terms of various trades.

Classification of Words — parts of speech, their function and relation to each other.

Use of words in sentences — qualities of a good sentence — unity, clarity, correctness and order of words, the use of various kinds of sentences for effective writing.

Expressing ideas in a paragraph — qualities of a good paragraph — unity, coherence, topic sentence, contrast. Paragraphs on trade topics, trade tools and equipment. Oral and written exercises.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ENGLISH-TECHNICAL — C109 (ENGLISH 130 II)

PART II

Prerequisite — Part I or equivalent.

Analysis and precis-writing—passages from trade texts, journals, periodicals and specifications to be rewritten in precis form.

Descriptive writing — the writing of short descriptions of a technical nature of tools and processes.

Technical writing — reports on an accident, reports on defective parts, the technical research essay.

Letter writing — applications for jobs, requests for material, reply to letters of complaint.

Comprehension — selected readings from "Developmental Reading" with questions to improve understanding of the language.

Speech — practise in the preparation and delivery of short speeches and lectures.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

APPLIED PHYSICS (TECHNICAL) C116— (Physics 133)

Prerequisite — Grade X or equivalent.

Air — Physical and chemical properties, pressure and vacuum, measurement of pressure, the barometer, the manometer, absolute pressure, gauge pressure.

Water — Physical and chemical properties, density and specific gravity, calculation of pressure at a depth, capillarity, P.H. factor.

Heat — Temperature scale, heat transmission, radiation, convection, conduction, the B.T.U., latent heat, coefficient of expansion, mechanical equivalent of heat, heat loss and prevention.

Gas laws — Expansion and compression of gases, Boyles law, the vacuum pump, the compression pump.

Hydraulics — Fluids under pressure, action of pressure pumps, action of the ventura, the Water Hammer.

Properties of Materials — Basic metallurgy, ferrous and non-ferrous metals, heat treatment.

Machines — Principles, efficiency, levers, inclined plane, gear drives, belt and chain drives.

Work energy and power — Units of energy and power, horsepower.

Friction — Laws, effects, coefficient of friction.

Strength of Materials — Stress and strain, safety factor, Young's Modular.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

AUDIO VISUAL THEORY FOR TECHNOLOGICAL AGE — C117 (SPECIAL)

Prerequisites — This course reserved for people employed as teachers—primary, secondary, adult.

Specific details that will be covered are:

1. INTRODUCTION —
   From Cave drawings to Holograms

2. THE PHYSIOLOGICAL BASIS OF PERCEPTION
   The eye, the ear, and the brain

3. TWO DIMENSIONAL VISUAL PERCEPTION
   The Line, the Shape, and the Area

4. VISIBLE CLUES AND THE THIRD DIMENSION — DEPTH

Perspective — linear and aerial
Interposition and line widths
Relative motion and apparent motion
Intensity gradients and roughness gradients

5. THE INVISIBLE CLUES AND THE FOURTH DIMENSION — TIME

Lucretius to Einstein
Memory and the perception of time
Perception of motion, events per second and apparent time

6. COLOUR THEORY

Subtractive colour mixtures and the Artist
Additive colour mixtures and Colour TV

7. INFORMATION THEORY

The human brain as a radio receiver

Psychology and Information Theory — awareness, motivation, set

Art and Information Theory — harmony, composition

The Teacher and Information Theory — What is a good transmitter?

The Student and Information Theory — What is a good receiver?

The Transmitter, The Receiver, and the Media between them.

* The course will be divided into approximately 50% theory, 50% practical.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A

ARCHITECTURAL TECHNOLOGY

Prerequisites — Candidates should be advised that many of the courses require considerable related experience. The prerequisites for any given course is a minimum.

BRICKLAYING — C130 (SPECIAL)

Prerequisite — This course is for tradesmen interested in improving and upgrading their skills and also for laymen who are interested in the trade.

Course Content — Bonds, preparation of mortars, layout of different types of walls, piers, pilasters, tools and equipment, types of bricks with characteristics and sizes, sand, lime and cement, methods of storage preparation of mortars in cold weather.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C

CABINET MAKING — C131 (SPECIAL)

Prerequisite — This course is for persons interested in cabinet making, including tradesmen interested in upgrading their skills.

Course Content — conditioning and use of hand and machine tools, joints used in cabinet making, types of fasteners used, layout and design.

Tuesday — 7.00 p.m. to 10:00 p.m. 60 hrs. Campus A.

CARPENTRY — C132 (SPECIAL)

This course is for tradesmen and laymen interested in improving and upgrading their skills.

Course Content — general stair layout and construction methods, roof framing, use of framing square.

Thursday — 7:00 p.m. to 10.00 p.m. 60 hrs. Campus A.

INTERIOR DECORATING — (SPECIAL)

Interior Decorating is the organizing of space and equipment for pleasant living. This course is planned to assist today's busy homemaker to improve the efficiency of her home as well as its appearance. Students are encouraged to bring their decorating problems for class discussion.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

LATHING — C133 (SPECIAL)

Prerequisite — This course is designed for tradesmen working at the Trade of lathing interested in improving their skills and knowledge.

Course Content — Materials of the trade, plastering accessories, tools of the trade, hand, power and bench. Geometry related to trade, drawings of projects. Estimating materials, metal and gypsum, acoustical layouts and component parts of various systems.

Monday — 7:00 p.m. to 10:00 p.m.

PAINTING AND DECORATING FOR THE HOME OWNER — C134 (SPECIAL)

This is an elementary course intended to help the small home owner.

Theory:—Safe working practices: choice of scaffold, tools and equipment.

Painting and re-painting of new and old surfaces: Classifications of material.

Practical:—Stripping old wallpaper: hanging of wallpaper: painting, staining and varnishing.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C

PLASTERING — C135

This course is designed for persons employed in the plastering trade.

Course Content — types of materials, tools, application of plaster, browning and finishing, repairing walls and ceilings, design of cornice moulds, construction of moulds, application of different types of moulds, bench running of moulds, mitring, cutting breaks, geometry related to the trade (arches, niches).

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

THE FLOORCOVERING INDUSTRY:

This is a growing industry with job opportunities in both sales and installation. There are two classes of installation work, residential and commercial. In the cities the work is quite specialised but in the rural areas a man skilled in the installation of sheet vinyl and linoleum as well as in carpet can make a very good living. This combines well with the upholstery business. The great increase in wall to wall carpeting has created a further demand for on location carpet cleaners. The following courses are offered:

COURSES FOR THE FLOOR COVERING INDUSTRY

C143 (SPECIAL)

An introductory carpet course for retail and wholesale salesmen. Of particular interest to furniture dealers, paint dealers and linoleum shops who are entering the carpet business.

Carpet construction, fibres, mill and showroom tours, measuring and estimating. Colour, design and the practical selling of carpet, cleaning and complaint handling. Also included is a short familiarisation course in installation methods.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

C138 (SPECIAL)

Practical carpet installation. Primarily for those already employed in tile and linoleum installation. Of value to a carpet layer's helper. Course includes the language of the industry, construction, fibres and practical installation.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

C139 (SPECIAL)

Advanced carpet installation for those who have completed C138. Emphasis is again on the practical and includes the commercial installation of specialised products, upholstered stairs, measuring and estimating. Designed for those already employed in the industry.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

C140 (SPECIAL)

Carpet cleaning: Carpet construction, fibres and installation methods. Spot and stain removal. In home and office cleaning methods.

Monday — 7:00 p.m. to 10:00 p.m. 30 hrs. Campus C.

C141 (SPECIAL)

Carpet repairing. This is designed for those already engaged in carpet maintenance or those who have completed F.C. 4.

Tuesday — 7:00 p.m. to 10:00 p.m. 30 hrs. Campus C.

C142 (SPECIAL)

Linoleum, sheet vinyl and tile installation. Designed for those engaged in the carpet business who wish to increase their skills to enable them to do complete residential installations.

Wednesday—7:00 p.m. to 10:00 p.m. 30 hrs. Campus C.

C143 (SPECIAL)

Retail Carpet Selling: This course will be given in some of the best showrooms in Toronto. It will combine British and American carpet selling techniques and introduce the salesman to both domestic and imported carpet lines. It will include Oriental carpets and popular priced broadloom. Primarily planned for those already employed in the carpet industry.

Monday — 7:00 p.m. to 10:00 p.m. 30 hrs. Campus C.

N.B. The foregoing courses are available to the floorcovering industry as an in service training program. The ten week courses can be given in from three to five days of full time study.

ARCHITECTURAL DRAFTING Part I — C150 (DR 102

This course is designed to teach the technical processes involved in architecture with the use of engineering problems and practical drawing. The first year covers methods and procedures of drafting as they apply to residential buildings.

Course Content — drafting equipment and procedure; foundation and floor plans for various types of construction; site plans — typical wall section; window details, door details; lathing and plastering details; stair details; fireplace and chimney details; freehand sketching.

Text: Architectural Drawing & Light Construction — Muller.

Monday — 7:00 p.m. to 10:p.m. Campus C.

ARCHITECTURAL DRAFTING Part II Second Year —C151 (DR202)

This course will be a continuance of the first year with elaboration of topics of the first year and additions of new materials and methods to allow progression to the drawing of a complete set of working drawings for a small industrial building. The emphasis of this course is NOT on aesthetic or structural design but primarily on skill development required to produce a set of working drawings to the highest standard of delineation.

Due to the amount of work required, much of the actual drawing must be done outside the regular hours set for this evening course.

Course Content — Planning drawing layout — presentation drawing in the form of rendered plan and elevation — drawing the plan or plans, elevations, full sections, details and structural drawings.

Prerequisite: Successful completion of the first year course, persons presently employed in the field of architectural drafting at the junior level or graduate of grade 12 Architectural Drafting.

Text: Architectural Drafting and Light Construction by Muller. Publisher — McGraw-Hill.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

BUILDING TRADES BLUEPRINT READING—C152 (CO-100B)

This course is intended for those working in all branches of the building trades and serves as a foundation for further study. It is also of much practical value to people engaged in many fields of business and industry who work in conjunction with the building trades. The content of the course includes the basic principles of drawings and a detailed study of blueprints.

Course Content — orthographic projection, dimensions, pictorial drawing, drawing to scale, symbols and conventions, standard constructions, plan study, construction details, plan reading and interpretation.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

QUANTITY SURVEYING (Part I) AND BUILDING CONSTRUCTION ESTIMATING — C153 (CO-101)

Prerequisite—Construction Methods & Materials Part I. This course is designed to enable students to prepare for the Canadian Institute of Quantity Surveyors Examination in Part I.

Course Content — Mathematics related to take off and estimating. General methods and procedures of taking off quantities for excavation, site works, concrete formwork and masonry.

Text — Method of Measurement of Construction Works (1st & 2nd Editions). Published by Canadian Institute of Quantity Surveyors. Construction Estimates from Take Off to Bid. Norman Foster.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

CONSTRUCTION METHODS & MATERIALS (Part 1) — C154 (CO-103)

Prerequisite — Building trades blue print reading.

This course is designed to enable students to prepare for the Canadian Institute of Quantity Surveyors Examination in Building Construction Part I.

Course Content — Excavation, foundations, brick, concrete & claytile, rough carpentry & millwork.

Text — Materials & Methods of Architectural Construction. Parker, Gay, MacGuire.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

REINFORCED CONCRETE DESIGN — C155 (SPECIAL)

A successful graduate would have acquired the fundamental principles of Reinforced Concrete Design to enable . . .

(a) further study of the more complex aspect of this field

(b) advancement in the industry through better understanding

(c) application for acceptance by professional associations.

Prerequisite — Grade 12 and/or acceptable work experience.

Course Content — Principles of Mechanics — forces, stresses, moments and reactions, shear and bending moments, theory of bending and properties of sections.

Concrete — manufacture of cement, properties and use of aggregates and additives and placement of concrete.

Reinforcing — reinforcing bars, bending and bending schedules and reinforcing bar placement.

Reinforced Concrete Design

— stresses in reinforced concrete
— modulus of elasticity
— design formulas for beams
— diagonal tension and web reinforcement
— bond
— design of rectangular reinforced concrete heams
— alternate design
— web reinforcement for girders
— design of T-beams
— one-way solid slabs
— design of one-way slabs
— load tables
— design of ribbed slabs
— design of stair slabs
— design of tied columns
— design of spiral columns
— design of wall footings
— design of independent footings.

National Building Code

— interpretation
— application.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

SURVEYING PT I — C156 (SURV. 101)

This course is provided for those employed as survey technicians in the field, civil engineering and survey draftsmen, plus construction personnel.
Part 1 covers the basic principles of surveying and the use of survey instruments. It includes some field practice.

Course Content — fundamental principles of surveying, levelling, chaining, use of the transit, bearings and azimuths, field notes, transit surveying, latitudes and departures, calculation of missing courses, calculation of areas by D.M.D.'s, earthwork computations, introduction to curves.

Text—Simplified Site Engineering by Parker and MacGuire.
Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

SURVEYING PT II — C157 (SURV. 110)

Prerequisite — Engineering Surveying 1 or equivalent.

Course Content — Simple curves, vertical curves, curve intersections, transition curves, stadia surveying, route surveys, area surveys, optics, adjustments of instruments, photogrammetry, observation for meridian.
Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

REINFORCED CONCRETE DESIGN — C159 (CIV 201)

This course covers most of the common problems encountered in elementary concrete engineering.

Prerequisite — Mechanical Engineering Drawing 1 or equivalent.

Course Content — Physical properties of concrete forces and internal stresses, design of beams, design of slabs, design of columns, detailing slabs, beams and columns, footing design and detail, design and detail of buttress and cantilever walls.

Text—Simplified Engineering for Architects and Builders.
Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

STRUCTURAL STEEL DESIGN & DETAILING Part I — C160 (CIV-200A)

This course is an introduction to the design and detailing of steel structures.

Prerequisite — Successful completion of basic courses in Arithmetic, Algebra, Understanding and Trigonometry.

Course Content — Force systems, force analysis of structures, stress and strain, shear and moment in beams, design of simply supported beams — structural steel, plain material, fabrication, bolted and welded connections.

Texts — Structural Steel Detailing/AISC.
Mechanics of Materials by I. J. Levinson.
Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

STRUCTURAL STEEL DESIGN & DETAILING Part II — C161 (CIV-200B)

Prerequisite — Structural steel design & detailing Part I or equivalent.

Course Content — Review of course content Part I. Introduction to columns, combined loading — column details, moment connections, built up members, girders, trusses, graphical and numerical stress solutions, splices for girders & trusses. Camber.

Texts — Structural Steel Detailing/AISC.
Mechanics of Materials by I. J. Levinson.
Tuesday — 7:00 p.m. to 10:00 p.m. Campus C.

SURVEYING & DRAFTING PART I — C164 (SPECIAL)

Extension

Prerequisite — Familiarization of surveying.

Course Content — Principles of drafting

(a) Use of instruments

(b) Linework

(c) Lettering — freehand
— mechanical

Property Plans
Sub-division Plans
Plans of right-of-way
Topography Plans
Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

PLUMBING Part 1 — C300 (SPECIAL)

Course Content — Elementary work in mathematics and science, materials and methods of jointing, plumbing tools, introductory work on water supply and drainage installations.
Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

PLUMBING Part 2 — C301 (SPECIAL)

Course Content — Mathematics, science and technical drawing as applied to plumbing, simple storm and sanitary drain installations, stacks, vents and plumbing fixture installations, water supply topics (domestic hot water, valves, meters, etc.) Ontario Plumbing Code Regulations.
Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

PLUMBING Part 3 — C302 (SPECIAL)

Course Content — advanced work in drainage, waste and vent installations, trenching, sumps and ejectors, back flooding, interceptors, private and municipal sewage disposal, water treatment, applied science, technical drawing.
Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

PLUMBING QUALIFICATION COURSE — C303 (SPECIAL)

This is designed as a refresher course in plumbing theory for those wishing to write the Ontario Certificate of Qualification examination or the Inter-provincial examination. Both the Provincial and "National" plumbing codes will be taken up.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

PLUMBING DESIGN & INSTALLATION — C305 (SPECIAL)

This course is designed for those wishing to prepare themselves for the responsibility of a master plumber.

Prerequisite — Journeyman's licence or Ontario Certificate of Qualification.

Course Content — Review of legislation relevant to the construction industry. Examination discussion and interpretation of the Ontario Plumbing Code. Mathematics and physics as necessary to understand design problems. Discounts, overhead and profit applications.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

SHEET METAL Part 1 — C306 (SPECIAL)

This course is designed for apprentices and beginners and covers the basic principles of pattern drafting.

Course Content — Use of drafting equipment by parallel line and radial line developments, oblique cylinder by parallel line method, segmental elbows by parallel line and radial line methods, oblique cone by radial line method. Approximately 25% of the time will be spent on shop work.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

SHEET METAL Part 2 — C307 (SPECIAL)

Prerequisite — Previous pattern drafting experience.

Course Content — Regular and irregular tapers, square to round and other transition pieces, tapered elbows of different sections, streamlined fittings, double and multiple branches of different sections, all by tri-angulation method.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

SHEET METAL THEORY — C308 (SPECIAL)

This course is designed to assist basic apprentices and apprentices failing to qualify in their tests in the basic fundamentals.

Types of seams, joints their location and manufacture, hand tools, equipment usc and maintenance, base metals, coated metals manufacture, gauge and usage. Duct systems furnaces and heating symbols.

Construction materials, City Bylaw, installation of low and high pressure systems and their parts, definition of terms for H, V, and AC, velocities and resistances of air flow and measuring equipment.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

SHEET METAL DESIGN AND INSTALLATION — C310 (SPECIAL)

This course is designed for those who wish to prepare themselves for the responsibilities of a master sheet metal worker.

Prerequisite — Currently employed in the sheet metal industry, with a journeyman standing.

Course Content — Labour legislation in relation to the construction industry — city by-law — underwriters, definition of terms applied to heating and air conditioning, use of N.W.A. and A.C.A. manuals for heat loss and heat gains, pipe sizing and location of outlets and inlets in residential installation, types of fans, air flow and types of instruments used, calculations in ventilation requirements, heating and pipe sizing by velocity, use of charts and tables.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs.
Campus A.

STEAMFITTING Basic — C311 (SPECIAL)

This course is designed to teach the basic fundamentals in steamfitting. Approximately two-thirds will be theory, one-third shop and practical.

Course Content — Elementary mathematics and physics relative to the heating industry, hot water systems, circuits, zones, controls, direct and indirect converters, heat loss calculations, isometric drawing, template design, schematic drawing, introduction to steam systems, temperature pressure relationship, boilers, heating elements, high pressure generating stations.

Use of tools, threading, cutting with acetylene and oxygen, tucking and basic welding, fittings, pipe, methods of joining.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

STEAMFITTING DESIGN AND INSTALLATION — C312 (SPECIAL)

This course is designed for those wishing to prepare themselves for the responsibilities of a master steamfitter or who wish to pursue their trade beyond the journeyman level.

Prerequisite — Journeyman's license or successful completion of steamfitting pre-license course.

Course Content — Review of hot water and steam systems, introduction to labour legislation pertaining to building trades, codes and regulations, heat loss calculations, radiation selection, design of heating systems, control of systems, introduction to air conditioning.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

STEAMFITTING QUALIFICATION — C313 (SPECIAL)

Prerequisite — This course is designed as a refresher course for apprentices preparing to write the license examination.

Course Content — A comprehensive review of apprenticeship course content, steamfitting regulations, science and technical drawing as applicable.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

STEAMFITTING — PNEUMATIC CONTROLS Part I — C314 (SPECIAL)

This course is designed for journeymen steamfitters who wish to broaden their knowledge in this specialized field.

Course Content — Elements of control, advantage and performance of pneumatic controls, control drawings, pipe installations, control theory, control applications, control adjustments, air compressors, maintenance of controls.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

STEAMFITTING — PNEUMATIC CONTROLS Part II — C315 (SPECIAL)

This course is designed for steamfitters who wish to specialize in this field, and those currently engaged in control work.

Course Content — Expansion of course I content, control layout, mechanical blueprint and specification reading, air flow, valve sizing and other necessary related knowledge for designing systems.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

REFRIGERATION — Part I — C520 (SPECIAL)

Prerequisite — Applicants should be employed in the refrigeration industry or some allied trade.

Course Content — Refrigeration fundamentals and principles, compression system of refrigeration, properties of refrigerants, metering devices, expansion valves, evaporators, condensers, compressors, flow equipment, electric controls and control valves, lubrication, servicing (charging and evacuation), trouble shooting problems, shop demonstrations of silver brazing.

Text — Principles of Refrigeration — Dossatt.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

REFRIGERATION — Part II — C521 (SPECIAL)

Prerequisite — Successful completion of Refrigeration Part I or equivalent experience.

Course Content — Review of fundamentals, defrosting methods, compressor drives, instruments and meters, piping and refrigerant lines, pressure drops, heat calculations, refrigerated enclosures, survey of refrigeration applications, humidity in refrigeration, cooling load calculations, secondary refrigerants, liquid cooling, absorption systems, codes and by-laws, safety precautions.

Text — Principles of Refrigeration — Dossatt.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

REFRIGERATION SERVICE ENGINEERS' SOCIETY SHOP COURSE — C522 (SPECIAL)

This course is designed to give practical application to Terms I and II of the R.S.E.S. Theory Courses.

Prerequisite — Successful completion of Terms I and II of the R.S.E.S. Theory Courses.

Course Content — Hand tools and their use; silver brazing; basic refrigeration cycle, open type unit assembly of piping controls and metering devices; evacuation and charging; electrical and mechanical trouble shooting; performance testing.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs.
Campus A.

Fees: To be established by R.S.E.S.

AIR CONDITIONING DESIGN — Part I — C523

This course is designed to cover the basic theory of air conditioning system design. It is of practical use to engineers, technicians, designers and draftsmen employed with consulting engineers, manufacturers and contractors in the air conditioning industry.

Prerequisite — Applicants should have a reasonable knowledge of mathematics at the Grade X level.

Course Content — Psychrometers, heating and cooling load calculations, low pressure duct design, fan laws, basic refrigeration cycle, reciprocating compressor selection, air conditioning equipment selection.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

AIR CONDITIONING DESIGN — Part II — C524

Prerequisite — Successful completion of Part I or equivalent experience.

Course Content — Centrifugal compressors, absorption machines, multi-office air conditioning systems, induction system design, high velocity duct design, water piping systems, control systems, water treatment, sound and vibration. This course includes a Conduit Weathermaster System Design Project.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

OIL BURNER — Part I — C727 (SPECIAL)

This course consists of approximately 40% theory and 60% shop and is designed to prepare students to write examinations for Oil Burner Servicing Licence Class III.

Prerequisite — Grade X or working with associated trades.

Course Content — Types of Domestic burners — parts of burners — filters — purpose of controls — settings for basic controls — fuel line problems — safety precautions — public relations — procedure for annual conditioning.

Tuesday — 7:00 p.m. to 10:00 p.m. 30 hrs. Campus B.

OIL BURNER — Part II — C728 (SPECIAL)

This course consists of approximately 50% theory and 50% shop. It is designed to prepare students to write the examination for Oil Burner Servicing Class II.

Prerequisite — Oil Burner I or satisfactory experience.

Course Content — Theory of combustion — types of burners — fuel units — transformers — combustion chambers — nozzles — tank installations — controls — heating systems — wiring diagrams — service procedures — regulations — public relations.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

HYDRONIC HEATING — C727 (SPECIAL)

Prerequisites — Grade X or equivalent.
This course is provided for persons wishing to gain a working knowledge of the design techniques for residential hot-water heating systems.

Course Content — The I-B-R Detailed and Modern methods of heat loss calculation. Components, equipment and controls. Design of "Series Loop Systems", "One-Pipe systems" and "Two-Pipe Reverse Return systems".

Monday — 7:00 p.m. to 10:00 p.m. 30 hrs. Campus B.

GAS FITTER (Pre-Licence) — C725 (SPECIAL)

This course is designed for persons presently engaged in the heating or appliance field, who wish to obtain the necessary knowledge to write the Department of Energy & Resources Management gas fitters examination.

Course Content — Properties of natural gas — fundamentals of combustion — gas piping — venting — appliance requirements — fundamentals of gas controls — conversion burners — commercial and industrial utilization — service problems — shop work.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

WARM AIR HEATING (Basic) — C726 (SPECIAL)

Prerequisites — Grade X or equivalent.
This course is provided for persons wishing to obtain a practical working knowledge of the design and installation techniques for residential Warm Air Heating Systems.

Course Content — Heat Loss and Heat Gain calculations by N.W.A. Methods—Components, equipment and controls — System specifications, layout and duct sizing procedures for winter use. Humidification, Air Cleaning and System Balancing techniques.

Wednesday — 7:00 p.m. to 10:00 p.m. 45 hrs.
Campus B. Fee $20.00.

WARM AIR HEATING AND AIR CONDITIONING (Domestic) — C728 (SPECIAL)

Prerequisite — Warm Air Heating Basic.
This course is provided for persons who have a good knowledge of the Basic Warm Air Heating design processes and who wish to obtain a working knowledge of the more advanced design techniques for 'Year' round heating and cooling systems.

Course Content — Heat Loss and Heat Gain calculations by N.W.A. Methods—Components, equipment and controls for heating and cooling. System specifications, zoning and duct sizing by N.W.A. Manual No. 9. Use of the Equal Friction charts. Uses of the Psychrometric Chart. Humidification and Dehumidification. The Heat Pump. Air Cleaning. System Balancing.

Wednesday — 7:00 p.m. to 10:00 p.m. 45 hrs.
Campus B. Fee $20.00.

ELECTRICAL/ELECTRONIC TECHNOLOGY

Prerequisites — Candidates should be advised that many of the following courses require considerable related experience. The prerequisite for any given course is a minimum requirement.

ELECTRICAL DRAFTING & CIRCUITRY — C155 (DR103)

Prerequisite — A knowledge of basic drafting.

Course Content — multi-view drawings, isometric drawing, general instructions for electrical drafting, circuit diagrams, switchboard design, residential wiring, industrial wiring, illumination design, power wiring, electrical estimating.

Text — Electrical Drafting by C. Bishop.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRICAL CONSTRUCTION Part 1 — C180 (EL10)

Prerequisite — Grade 10 or the equivalent.

Course Content — Ohm's Law, series circuits, combination circuits, two-wire distribution, line loss, power efficiency, Hydro Electric Power Commission regulations, shop projects.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs.
Campus A.

ELECTRICAL CONSTRUCTION Part 2 — C181 (EL20A)

Prerequisite — Electrical Construction Part 1 or equivalent.

Course Content — wire calculations, batteries, magnetism, electro-magnetism, induction, three-wire distribution, Hydro Electric Power Commission regulations, shop projects.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRICAL CONSTRUCTION Part 3 — C182 (EL20B)

Prerequisite — Electrical Construction Part 2 or the equivalent.

Course Content — electro-magnetism, induction, DC generators, generator set-up and operation, DC motor, motor operation and controls, Hydro Electric Power Commission regulations, shop projects.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRICAL CONSTRUCTION Part 4 — C183 (EL30)

Prerequisite — Electrical Construction Part 3 or the equivalent.

Course Content — Fundamental AC vectors, single phase transformers, three-phase motors, three-phase transformers, auto transformers, Hydro Electric Power Commission regulations, shop projects.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ESTIMATING FOR THE ELECTRICAL TRADE — C184 (SPECIAL)

Prerequisite — Journeyman electrician or equivalent.
Course Content — plan analysis, take-off procedure, transferring and pricing, labour units, installation only projects, adjustments for working conditions, cable poles, pull boxes, labour cost variables, non productive labour, incidental and direct job cost, electric heating loads.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

HYDRO ELECTRIC POWER COMMISSION REGULATIONS — C185 (SPECIAL)

Prerequisite — Applicants must be at least fourth year apprentices.

Course Content — authority, interpretations, use of the index, application of regulations.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

INDUSTRIAL ELECTRONIC CONTROLS Part 1 — C186 (EL40A)

Prerequisite — Applicants must be fourth year apprentices, journeyman electricians, or maintenance electricians.

Course Content — Review of basic principles, thorough study of AC theory, vector analysis, introduction to electronics and shopwork.

Instruction in this course will consist of 65% theory and 35% shopwork.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

INDUSTRIAL ELECTRONIC CONTROLS Part 2 — C187 (EL40B)

Prerequisite — Applicants must be fourth year apprentices, journeyman electricians, or maintenance electricians who have successfully completed Part 1.

Course Content — types of electronic tubes, amplifiers, tube circuitry and application, phanotrons, thyratrons and shopwork.

Instruction will consist of 40% theory and 60% shopwork.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

INDUSTRIAL ELECTRONIC CONTROLS Part 3 — C188 (EL40C)

Prerequisite — Industrial Electronic Controls Part 2.

Course Content — power supplies, principle of timers, welding timers, current control with gas tubes, thyratron contactors, ignitron contactors, phase shifting, welder heat control, resistance welders, sequence weld timers, synchronous weld timers, shopwork.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs.
Campus A.

INDUSTRIAL ELECTRONIC CONTROLS Part 4 — C189 (EL40D)

Prerequisite — Industrial Electronic Controls Part 3.

Course Content — photoelectric relays, heat controls, light dimming controls, principle of speed and voltage regulators, speed regulators for small DC motors, voltage control for DC and AC generators, single phase and poly-phase power rectifiers, oscillators, inverters, induction heaters, dielectric heaters, high speed light relays, register control servomechanisms, shopwork.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRONIC FUNDAMENTALS Part 1 — C200 (Combination of Part I and Part II — ELTC 100 & 101)

Course Content — DC theory, electron theory, current flow, magnetism, electromagnetism, motor action, transformers, capacitors, AC theory, resonance, impedance, bandwidth, tubes, diodes, triodes, pentodes.

Lab — suitable series of laboratory experiments co-related to theory.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

ELECTRONIC FUNDAMENTALS Part 2 (Radio) — C201

Prerequisite — Successful completion of Electronic Fundamentals Part 1 or equivalent.

Course Content — Power supplies, audio frequency output stages, detection, intermediate frequency amplifiers, oscillators, converters, RF amplifiers, superheterodyne receivers.

Lab — Suitable series of lab experiments correlated to theory as well as construction and test measurements on superheterodyne receivers.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

ELECTRONIC FUNDAMENTALS Part 3 (Television) — C202 (ELTC 102A)

Prerequisite — Successful completion of Electronic Fundamentals Part 2 or the equivalent.

Course Content — Principle of TV transmission and reception, scanning, cathode ray tube, deflection circuits, multivibrator, blocking osc. deflection coils and transformers, damper circuit, high voltage circuits, synchronization circuits.

Lab — suitable series of lab experiments co-related to theory.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

ELECTRONIC FUNDAMENTALS Part 4 (Television) — C203 (ELTC 102B)

Prerequisite — Successful completion of Electronic Fundamentals Part 3 or equivalent.

Course Content — video amplifiers, picture intermediate frequency amplifiers, alignment of TV intermediate frequency amplifiers, A.G.C. circuits, sound intermediate frequency amplifiers, power supplies, tuners, dynamic test points in TV receivers, trouble shooting.

Lab — suitable series of lab experiments co-related to theory.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

COLOUR TELEVISION — C204 (SPECIAL)

Prerequisite — sound knowledge of black and white television circuitry. Applicants must be engaged full time in television servicing. There will be a short qualifying test at the time of registration.

Course Content — Principles of the colour TV system, colour receiver circuits: RF and IF circuits, video, sync and voltage supply circuits, band pass amplifier colour sync and colour killer circuits, colour demodulation, matrix section, colour picture tube and associated circuits — servicing the colour receiver; set up procedure, aligning the colour receiver, trouble shooting. Current models of receivers will be discussed and demonstrated.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

ADVANCED TELEVISION SERVICE TECHNIQUES — C205 (SPECIAL)

Prerequisite — Since technicians who successfully complete this course will be accredited by the Electronic Industries Association, applicants must be engaged full time in television servicing. Accordingly there will be a short qualifying test at registration.

Course Content — This course deals with modern TV fault-finding techniques based on increased knowledge of circuit operation and proper use of test equipment.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

TRANSISTORS — C206 (ELTC 103)

Prerequisite — Thorough knowledge of electronic fundamentals and radio receiver circuitry.

Course Content — Introduction to modern electron theory, semi-conductor physics, junction transistors, transistor characteristics, transistor amplifiers, transistor oscillators, transistor radio receivers, transistors in television receivers, transistors in electronic circuits, transistor developments, servicing transistor circuits. Laboratory work will form part of the course.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

DIGITAL COMPUTER PRINCIPLES — C207 (ELTC 201)

Prerequisite — Electronic Fundamentals Part 2 or equivalent. Some previous transistor theory helpful.

Course Content — Review transistor theory, transistor switching circuits, computer number systems, diode and transistor logic circuits, boolean algebra and venn diagrams, computer memory and storage circuits, counters, shift registers, matrices, comparators.

Lab — Basic transistor circuits, switching circuits, logic circuits, transistor flip-flops, counters.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

HIGH FIDELITY TECHNIQUES — C208 (SPECIAL)

Prerequisite — Successful completion of Electronic Fundamentals Part 1 and Part 2 or equivalent.

Course Content — FM tuners, turntables, cartridge stylus, tone arms, types of motors, pre amplifiers, mono, stereo, power amplifiers, classes of operation, types of distortion, detection and remedy, output transformers, impedance matching, decibel speakers, tape recorders, multiplex.

Lab — Suitable demonstrations and applications of test equipment co-related with course material.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

The following courses are being offered by The George Brown College under the sponsorship of the Cable Television Association.

CABLE TELEVISION PRACTICE (BASIC) C214 (SPECIAL)

Prerequisite — Grade X and Electronics Fundamentals I and II

1. Introduction to television. Conversion of light to an electric signal. Use of the sync. signal and derivation of composite waveform. Comparison of black and white and colour. Modulation of the RF carrier. Channel allocations. Propagation and antennas. Elements of the receiver and reproduction.
2. Introduction to cable distribution. The basics of antenna site location, system layout, amplifiers, splitters, tap-off devices, subscriber's drops.
3. Co-axial cable characteristics, attenuation, impedance, loop resistance, requirements for impedance matching.
4. Decibels, VSWR, and return loss, and reflections.
5. Amplifiers, general description, tube type, transistorized, wideband, single-channel, main line, distribution and line extender. Power feed arrangements for transistorized amplifiers.
6. Line construction techniques — clearances, safety procedures, cable handling, connector splices etc.
7. Tap-offs, and subscriber's drop and apartment house wiring.
8. Installation of amplifier housings, amplifiers and passive devices.
9. Service calls and customer relations.
10. Introduction to fault-finding using field strength meter and test TV set.
11. Fault diagnosis — adjacent channel and co-channel interference, cross-modulation, ghosts and noise.

12. Transistorized equipment and cable powering — basic do's and don'ts.

Monday and Wednesday — 7:00 p.m. to 10.00 p.m. — 60 hours. 2 nights per week — Campus C.
Basic course September 30 to December 4, 1968.

CABLE TELEVISION PRACTICE (ADVANCED) C215 (SPECIAL)

Prerequisite — Basic Cable Television Practice or recommendation of employer.

1. Review of the television system from transmitter to receiver, modulation, demodulation, waveforms, propagation, reception.
2. Co-axial cable characteristics, decibels, VSWR, impedance matching.
3. Amplifiers, types and application.
4. System design, cascading, noise, intermodulation, levels, equalisation, AGC, etc.
5. System layout, mapping, liaison with utilities, etc.
6. System construction, cable acceptance, set-up and testing.
7. Tube amplifiers — single channel, tuned broadband, distributed line, with explanations of typical circuits in detail.
8. Basic transistor theory and application to typical amplifiers.
9. Amplifier alignment procedure.
10. Head-end equipment—antennas, pre-amplifiers, channel commanders, converters, modulators and F.M. equipment.
11. Subscriber's taps — pros and cons of various methods.
12. Review of cable construction techniques, including underground distribution.
13. System testing and maintenance including use of sweep and marker generator, detector and scope, pads and delay lines.
14. Noise — determining signal to noise ratio of system and measuring noise figures.
15. Intermodulation distortion — causes and measurement techniques.
16. Line testing and fault finding including system radiation, interference originating at antennas and use of new techniques including TDR and spectrum analyser.

Monday and Wednesday — 7:00 p.m. to 10.00 — 60 hours. 2 nights per week — Campus C.

Advanced course January 6, 1969 to March 12, 1969.

APPLIANCE SERVICING — Part 1 (Electrical Fundamentals and small appliances) — C172 (SPECIAL)

Prerequisite — Grade X or satisfactory equivalent.

Course Content — Nature of Electricity, Basic Electrical Quantities, Ohm's Law and its application, Electrical Circuits, Magnetism and Electromagnetism, Electrical

Circuitry and Fault Finding, Motors, Power and Heating Effects, Electrical Measuring Instruments, Various Switching Devices, Theory and Repair of Small Appliances.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

APPLIANCE SERVICING — (Domestic Refrigeration) Part 2 — C173 (SPECIAL)

Prerequisite — Satisfactory completion of Part 1 or equivalent.

Course Content — Fundamentals, Compression system of Refrigeration, Refrigerants, Liquid Feed Devices, Evaporators, Compressors, Condensers, Electric Motor Controls, Defrosting and Food Preservation, Evaluating, Charging, Leak Testing, Dismantling and Assembling procedures for Refrigerators and Air Conditioners, Circuit Tracing, Fault Finding, Service Analysis.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs.
Campus B.

APPLIANCE SERVICING — (Laundry and Kitchen Equipment) Part 3 — C 174 (SPECIAL)

Prerequisite — Satisfactory completion of Part 1 or equivalent.

Course Content — Theory and Operation of Wringer and Automatic Washers, Dryers, Ranges and Dishwashers, Fault Finding and Repair Procedures, Circuit Tracing, Service Analysis.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

ELECTRIC MOTOR REPAIR — Part I — C700 (SPECIAL)

Introduction to D.C. Motor Repair Theory and Shopwork.

Prerequisite — Grade X.

Course Content — Kinds of Electricity — series and parallel circuits — units of electricity — magnetism and magnetic fields — Use of meters and test equipment — drop testing — operating principles of series, shunt and compound motors — conversion to D.C. generators. During the course, students will build a motor, including the field and armature winding.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

ELECTRIC MOTOR REPAIR — Part II — C701 (SPECIAL)

Theory and Shopwork Single Phase Motors.

Prerequisite — Grade X.

Course Content — A study of various types of single phase motors — starting mechanisms — fault finding — rewinding methods — assembling — testing and test equipment.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

ELECTRIC MOTOR REPAIR — Part III — C702 (SPECIAL)

Three Phase Motor.

Prerequisite — Courses I or II, or appropriate work experience.

Course Content — Electrical calculations — star and delta connections and comparisons — types of motors — rewinding — testing — use of meters and test equipment.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

FOOD TECHNOLOGY

Prerequisites — Candidates should be advised that many of the following courses require considerable related experience. The prerequisite for any given course is a minimum requirement.

SPECIAL COURSES

The Food Technology Department of The George Brown College of Applied Arts and Technology are offering two special courses through the extension department for the 1968-69 term.

Names of the courses are:

1. Beverage Sales and Service Part I
2. Beverage Management Part II

If interest is sufficient additional courses will be offered as follows:

— Small Bakery Management
— Food Management for Homemaker.
— Commercial Food Purchasing
— Menu Planning & Cost Control
— Restaurant Accounting
— Buffet Preparation (emphasis on competition).

Persons interested in any of these courses should contact Mr. C. Adamson direct.

Write Mr. C. Adamson, Food Service Department Chairman, 21 Nassau Street, Toronto 2B, Ontario, or telephone 365-6187.

PRACTICAL BAKING 1 — C800 (BAK 10-1A)

This course is designed for anyone wishing to acquire a basic knowledge of baking. Special emphasis will be placed on variations, quality and eye appeal.

Course Content—Breads, pastries, cakes, French pastries, puff pastries and pate aux choux — pre-mixes and other convenience products. Course will also include demonstrations with student participation.

Monday — 7:00 p.m. to 10:00 p.m. Instructor J. Polak, Baking Laboratory. 60 hrs. Campus A.

PRACTICAL BAKING 2 — C801 (BAK 10-1B)

Prerequisite — Successful completion of Baking 1 or presently employed in the baking or food service industry.

Course Content — Charlotte Russe, mousses, Bavarians, fancy cakes, petit fours, royal icing, sugar work, pulled sugar demonstrations, practical food laboratory work.

Tuesday — 7:00 p.m. to 10:00 p.m. B. Nolte, Baking Laboratory. 60 hrs. Campus A.

COOKING FOR SPECIAL OCCASIONS — (E 806) (CHEF 10-1B)

Course Content — Menu planning, preparation and service of banquets for festive occasions, planning and arrangement for club luncheons, decorating and glazing

centerpieces for festive buffets, student preparation in practical work, cooking with herbs, spices and wine, cocktail party preparation for homes and businesses, hot and cold hors d'oeuvre, preparation of molded salads, cooking Venetian Fritto Misto, fancy sandwiches, art of carving vegetables for buffet table attractions.

Wednesday — 7:00 p.m. to 10:00 p.m. M. Prior, Food Laboratory. 60 hrs. Campus A.

PRACTICAL COOKING COMMERCIAL I — C807 (CHEF 10-1A)

Prerequisite — This course is offered to those persons who have a basic knowledge of cooking. Lectures, demonstrations and student participation are designed to teach practical cooking with a difference. Emphasis will be placed on variations of taste and texture in normal everyday foods, keeping in mind accurate costing and portion control.

Course Content — Basic soups and sauces, roasting, broiling and baking of meats, poultry cookery, roasting, sauteing, casseroles, various methods of preparing and cooking fish with accompanying sauces and garnishes, salad preparation with suitable dressings, use of fresh fruit and vegetables, vegetable cookery, egg cookery, sandwich preparation.

Tuesday — 7:00 p.m. to 10:00 p.m. Instructor K. Sawodny, Food Laboratory. 60 hrs. Campus A.

PRACTICAL COOKING HOMEMAKERS — 808 (SPECIAL)

Prerequisites — This course is offered to those persons who desire to obtain a thorough knowledge of practical cooking. Lectures, demonstrations and student participation designed to teach practical cooking based on classical culinary arts.

Course Content — Basic stocks, sauces and derivatives, soups, methods of cooking meat, poultry, fish and game by sauteing, broiling, roasting, poaching and boiling, braising and stewing, deep frying, etc. Shellfish, variety meats, etc. Stuffings and fillings. Vegetables and methods of cooking same. Salads and suitable dressings, egg cookery. Introduction to pastries, breads, and various desserts.

Monday — 7:00 p.m. to 10:00 p.m. G. Bourbeau, Food Laboratory. 60 hrs. Campus A.

CAKE DECORATION AND DESIGN I—C816 (BAK 10-1C)

This course is designed for those persons who wish to learn the art of cake decoration and design.

Course Content — Icings and coatings, royal icing, fondants, butter creams, couvertures, boiled icing and frostings, basic design, techniques of piping, decorating materials, methods, freehand, geometric designs, stencils, run-outs, prefabricated decorations, lettering, flowers, border designs etc.

Cakes for special occasions — techniques and methods.

Wednesday — 7:00 p.m. to 10:00 p.m. Instructor F. Steel, Baking Laboratory. 60 hrs. Campus A.

RETAIL MEAT STORE MANAGEMENT — C820 (FOOD 140-1B)

This course is designed for persons in positions below that of manager who wish to upgrade their knowledge and any person actively engaged in small meat store operation.

Course Content — Financial control of retail meat operation, buying, receiving, storing, art of displaying, costing, personnel handling, advertising, customer relations, advanced cutting techniques for extra profit.

Monday — 7:00 p.m. to 10:00 p.m. Instructor M. Kerman. Cafeteria II. 60 hrs. Campus A.

RETAIL MEAT CUTTING — C821 (FOOD 140-1A)

This course is designed for persons in junior positions in the retail meat trade and persons interested in the skill of meat cutting.

Course Content — Cutting, grading and characteristics of beef, pork, lamb and veal carcasses. Preparation of poultry, fish and shellfish for retail sale, preparation and use of various animal organs, desplaying and merchandising of all types of meat products.

Tuesday — 7:00 p.m. to 10:00 p.m. Instructor M. Kerman. Cafeteria I. 60 hrs. Campus A.

APPLIED ARTS

Prerequisites — Candidates should be advised that many of the following courses require considerable related experience. The prerequisite for any given course is a minimum requirement.

HAND ENGRAVING — 400 (SPECIAL)

Prerequisite — Currently employed in the jewellery industry.

Course Content — Engraving in copper of linear and circle ornaments, wriggling and wriggling decorations, closelining and brightcutting, engraving in copper of simple and fancy letters and monograms, engraving in brass and silver, engraving of coats of arms, crests and other designs.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRIC WATCH SERVICE — 401 (SPECIAL)

Prerequisite — Currently employed in the watchmaking industry.

Course Content — Introductory electricity, Bulova, Accutron, Hamilton Electric Watches, Swiss Electric Watches, Timex Electric Watches, care in conditioning and handling of electric watches.

Note — This course will consist of 10 evenings.

Wednesday—7:00 p.m. to 10:00 p.m. 30 hrs. Campus A. Fee—$13.00.

MEN'S HAIRSTYLING — C402 (SPECIAL)

Prerequisite — Applicants must be licensed barbers currently employed in the trade.

Course Content — Theory — cells, digestion, circulation, muscles, skin, hair, film. Practical-haircutting, shaving, facials, shampoos, high-frequency, pictures, discussion on styles, styling and blow waving, tinting, bleaching, processing, razor cutting.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

JEWELLERY DESIGN — 410 (SPECIAL)

Prerequisite — Applicants may either be employed in the Jewellery industry or interested in jewellery design as a hobby.

Course Content — Development of designs for modern jewellery, rendering of projections in black and white and in colour, rendering of perspective drawings in black and white and in colour.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

JEWELLERY MAKING — 411 (SPECIAL)

Prerequisite — Currently employed in the jewellery industry or hobbyists.

Course Content — Planishing, hard soldering, finishing and polishing of precious metals, elementary jewellery repairs, shaping and forming settings for coloured stones and pearls, transferring designs to metals, cuttlefish casting, centrifugal casting, making models for fast production methods, handmaking of rings, brooches, pendants, earrings and bracelets.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

GEMMOLOGY — 425 (SPECIAL)

Prerequisite — Applicants may either be employed in the jewellery industry or interested in jewellery design as a hobby.

This course is offered in close co-operation with the Gemmological Association of Great Britain. The course is taken during two successive winters and upon successful completion of the two examinations the Fellowship of the Association will be granted.

Materials and books $100.00 per session.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

WATCHMAKING — 420 (SPECIAL)

Prerequisite — Currently employed in the watchmaking industry.

Course Content — Lathe work, balance work, hairspring work, clock work, watch conditioning, escapement matching, jewelling, making staffs and stems, adjusting, complicated watches, preparation for Canadian Jewellers' Association examinations.

Note — Each section must be successfully completed before further advanced training may be undertaken.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ADVANCED WATCHMAKING — 421 (SPECIAL)

Prerequisite — Applicants must be qualified watchmakers willing to study modern advanced theory of watch construction, repair and adjustment. This is a pre-examination course for candidates seeking Ontario certification as a watch repairer.

Course Content — Power supply, gearing, escapement theory, pendulums, balance wheel and hairspring work, hairspring theory, watch cleaning, oiling problems, theory of friction, watch jewelling, watch adjustments.

Note—Lectures will be supplemented by practical bench work wherever possible.

Tuesday & Thursday — 7:00 p.m. to 10.00 p.m. — 120 hrs. — two nights per week. Campus A.

DENTAL TECHNICIAN

Complete Denture Prosthesis	C450
Partial Denture Construction	C451
Orthodontics	C452
Crown and Bridgework	C453
Ceramics and Ceramics to Metal	C454

These courses are offered to technicians who are at present working in a dental laboratory or for a dentist and cover same work as provided in our DENT 160-day course.

Theory and practical work is offered in these courses of three hour sessions each evening.

Monday	Partial Denture Construction
Tuesday	Complete Denture Prosthesis
Wednesday	Ceramics and Ceramics to Metal
Thursday	Orthodontics
Thursday (Saturday)	Crown and Bridgework.

Every attempt will be made to provide each student with the instruction and experience he most needs on an individual basis.

As above. 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

TEACHING TECHNIQUES — C675 (SPECIAL)

This course is designed for people in industry, commerce professions and adult education who have an interest in the instruction of other people. It is a basic course combining a minimum of pedagogical theory with practical instructional technique.

Course Content — Theories of learning — adult learning — individual differences — subject analysis — lesson planning — curriculum development — lesson types — teaching aids — evaluation — practice teaching — critical appraisals of teaching techniques.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

HAIRDRESSING — PRE-CERTIFICATION — 426 (SPECIAL)

Prerequisites — applicants must hold a Dept. of Labour work permit.

This is a course designed to prepare candidates for the Department of Labour qualification examination.

Course Content — Theory — Bacteriology, Sterilization, Shampoo & Rinses, Scalp treatments, Hair Shaping, Hair Styling, Cold Waving, Massage, Hair Colouring, The Skin, hair & nails, Disorders of the skin, scalp & hair — Practical-Shampooing, Scalp treatments, Hair cutting, Styling, Fingerwaving, Cold Waving & Hair Colouring.

Tuesday & Thursday 7:00 P.M. to 10:00 p.m. 60 hrs. Campus A.

LADIES ADVANCED HAIRSTYLING — 487 (SPECIAL)

Prerequisite — licensed hairdressers.

Course Content — Blunt Scissor cuts (Sassoon), Advanced razor cutting techniques, Dimensional Hair colouring, Advanced Styling Techniques, Back Brushing, Back Combing, Long Hair Arrangement, Blow Waving and Comb-out Techniques.

Monday & Wednesday 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

COMMERCIAL

BUSINESS MACHINE SERVICING — PART 1 C601 (SPECIAL)

The aim of this course is to familiarize the student with the operational principles and servicing of typewriters.

Prerequisite — Grade X or equivalent and some experience in the business machine or related fields.

Course Content — Operating, checking and trouble-shooting — removal and replacement of the major parts — repairing and adjusting.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

BUSINESS MACHINE SERVICING — PART II C602 (SPECIAL)

Adding Machine Servicing: In this course the student will be taught the operating principles and servicing of adding machines.

Prerequisite — (a) Grade X. (b) Students should be employed in the office equipment industry.

Course Content — Theory of adding machines — tape reading — trouble-shooting — repairing — adjusting — checking and replacement of parts such as printing mechanism, stop section racks unit, power unit and accumulation units.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

GRAPHIC ARTS

Prerequisites — Candidates should be advised that many of the following courses require considerable related experience. The prerequisite for any given course is a minimum requirement.

SIGNWRITING — C136 (SPECIAL)

This course is designed to give the fundamentals of general signwriting and the hand cut silk-screen process.

Course Content — Basic lettering strokes, alphabets, colour theory and the principles of good layout. Elementary silk-screen process.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

SCREEN PROCESS—PRINTING—C-137 (SPECIAL)

This course is designed for persons currently employed in this field who wish to upgrade their skills in the more specialized methods of the photographic process.

Course Content — The operation of the process camera, line and halftone film making. The proto-screening method of silk-screen reproduction. Preparation of direct screen emulsion stencils. The application and procedure to good screen making.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

SCREEN PROCESS PRINTING (BASIC) — C138

This course is designed for persons not in the industry, but who wish to attain skills in basic stencil cutting, screen making and printing.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

ENGINEERING TECHNOLOGY

NOTE:

Candidates should be advised that many of the following Welding courses require considerable welding experience.

The prerequisite for any given course is a minimum requirement. The College cannot assume responsibility for the failure of a student who registers for a course for which he has less than the stated prerequisites.

WELDING Part I — C500 (SPECIAL)

This is a general course designed to teach the fundamentals of oxy-acetylene and electric arc welding.

Prerequisite — Ability to understand English well enough to absorb instruction.

Course Content — Basic principles of oxy-acetylene and electric arc welding, safety precautions, types and uses of various oxy-acetylene flames, types and uses of various rods and electrodes, braze welding, use of fluxes, explanation of arc welding machine controls, practice welding in the flat position using oxy-acetylene and electric arc equipment.

Choice of: Tuesday or Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

WELDING Part II — C501 (SPECIAL)

This is a general course designed to supplement Welding Part I.

Prerequisite — Successful completion of Part I or equivalent experience.

Course Content — Theory of alternating and direct current, polarity, arc blow, shielded arc electrodes, classification, colour markings and selection of electrodes, edge preparations, joint design, weld faults, manufacture and storage of oxygen and acetylene, basic welding metallurgy, control of distortion, testing of welds, practice welding in all positions using oxy-acetylene and electric arc equipment.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

WELDING — PRE-CERTIFICATION — C502 (SPECIAL)

This is a course designed to prepare candidates for the Department of Labour or Canadian Welding Bureau metallic arc qualification tests.

Prerequisite — Successful completion of Welding Parts 1 and 2 or equivalent experience.

Course Content — Electrode selection and application, edge preparation, weld faults, control of distortion, set up of equipment, test procedures, welding techniques, testing of welds and operators, codes, practice welding of fillet and butt joints in all positions with the emphasis on butt joints. Root and face guided bend test specimens will be taken from butt welds in all positions.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A. Fee — $50.00.

PIPE WELDING 'A' — OXY-ACETYLENE — C503 (SPECIAL)

This is a course designed to teach the fundamentals of pipe welding in all positions using the oxy-acetylene process.

Prerequisite — Successful completion of Welding, Parts 1 and 2.

OR

A minimum of six months continuous oxy-acetylene welding experience.

Course Content — Pipe specifications, pipe fittings, preparation of pipe, types and sizes of welding rods, flame adjustments, layouts of pipe and templates, testing of welds and operators, codes, practice welding on 2", 4" and 6" diameter pipe in all positions, fabrication of pipe branches, manual oxy-acetylene cutting.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A. Fee — $50.00.

PIPE WELDING 'B' — DOWNHILL ARC WELDING — C504 (SPECIAL)

This course is designed to teach the fundamentals of the downhill method of pipe welding using arc welding equipment and cellulose arc welding electrodes.

Prerequisite — (1) Successful completion of Welding, Parts 1 and 2 and Welding pre-certification.

OR

(2) Department of Labour or Canadian Welding Bureau certification for all positions.

Course Content — Pipe specifications, preparation of pipe, recommended fits and tolerances, electrode selection and classification, testing of welds and operators, codes, practice welding using the downhill welding technique and cellulose arc welding electrodes.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A. Fee — $50.00.

PIPE WELDING 'C' — UPHILL ARC WELDING — C505 (SPECIAL)

This is a course designed to teach the fundamentals of the uphill method of pipe welding using arc welding equipment and low hydrogen arc welding electrodes.

Prerequisite — (1) Successful completion of Welding Parts 1 and 2 and Welding pre-certification.

OR

(2) Department of Labour or Canadian Welding Bureau certification for all positions.

Course Content—Pipe specifications, preparation of pipe, recommended fits and tolerances, electrode selection and classification, testing of welds and operators, codes, practice welding using the uphill welding technique and low hydrogen arc welding electrodes.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus A. Fee — $50.00.

INERT GAS WELDING (HELIARC) — Part I — C510 (SPECIAL)

This is a course designed to teach the fundamentals of manual tungsten inert gas (T.I.G.) and semi-automatic metal inert gas (M.I.G.) welding to persons who are qualified oxy-acetylene or electric arc weldors.

Prerequisite — Successful completion of Welding Parts 1 and 2 or a minimum of six months continuous experience in oxy-acetylene or arc welding.

Course Content — Setting up and adjusting T.I.G. and M.I.G. equipment, types, sizes and uses of tungsten electrodes, types and sizes of filler wires, shielding gases, practice welding of mild steel, stainless steel, and aluminum using T.I.G. and M.I.G. equipment.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A. Fee — $50.00.

INERT GAS WELDING (HELIARC) — Part 2 — C511 (SPECIAL)

This is a course designed as a supplement to Inert Gas Welding — Part 1 to teach advanced methods and techniques used in manual tungsten inert gas (T.I.G.) and semi-automatic metal inert gas (M.I.G.) welding processes.

Prerequisite — Successful completion of Inert Gas Welding — Part I or equivalent experience.

Course Content — Equipment and power sources used for T.I.G. and M.I.G. processes, wire feed mechanisms, trouble shooting, joint design and preparation, filler wires, testing of welds and operators, codes, practice welding of aluminum and stainless steel tubing, sheet and plate in all positions, incorporating various joint designs and using both T.I.G. and M.I.G. processes, welding of aluminum and carbon steel pipe in all positions using the T.I.G. process.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus A. Fee — $50.00.

CANADIAN WELDING BUREAU-ALUMINUM WELDING — 515 (SPECIAL)

This course is designed to teach the manual and semi-automatic welding of aluminum.

Prerequisite — Applicants must be enrolled in Canadian Welding Bureau Aluminum Welding Correspondence Course.

Course Content — Setting up and operation of manual and semi-automatic equipment, tungstens, shielding gases, welding techniques, filler wires, shop practice using manual and semi-automatic equipment on aluminum.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A. Fees — To be established by C.W.B.

MECHANICAL MAINTENANCE—C162 (SPECIAL)

Prerequisite — This course is designed for those working as maintenance mechanics who have a sound knowledge of hand tools and wish to improve their skills in the

operation of the lathe and their knowledge of materials.

Course Content—Properties of iron and steel, heat treatment of steel, case hardening, non-ferrous metals, metal cutting, rake and clearance for hand and lathe tools, cutting speeds, tool grinding, lathe construction and operation, lathe tools and attachments, use of lathe for machine repair operations, resurfacing shafts, shop projects.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

MECHANICAL ENGINEERING DRAWING — C158 (DR101)

This course gives the fundamentals of drafting for a wide range of industrial requirements.

It serves as an introduction to the specialized courses offered by the Institute where entry requirements are not met by other qualifications.

Course Content—Fundamental drawing practice, pictorial drawing, engineering fasteners, drawing standards, tolerances, welded joints & symbols, structural shapes, piping symbols, detail & assembly drawings, introduction to gears, materials.

Text — Technical Drawing by Gieseke, Mitchell and Spenser.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

PLASTICS THEORY & TECHNIQUES

Prerequisites—Grade X or suitable experience in plastics industry.

A unique opportunity is being offered to persons already engaged in the plastics industry as well as to those wishing to ohtain a comprehensive understanding in this field.

A month-by-month schedule will be mailed to each student, listing the various discussions to be held, as well as other items of interest. Attendance at these discussions is voluntary since the course is conducted on an assignment basis, permitting the student to study on his own, both "in school" and at home.

The objectives of this new approach to the study of Plastics Theory and Techniques are:

1. To upgrade the technical knowledge of those employed in or connected with the plastics industry.
2. To provide the student with a knowledge of a more extensive range of plastics materials, processes and equipment.
3. To provide an opportunity for the student to become acquainted with current and new techniques.
4. To provide an opportunity for the part-time student to complete the credits necessary to qualify for the Plastics Techniques Diploma or Certificate which is awarded to successful students.
5. To provide an opportunity for the part-time student to select and study the specific areas which interest him.

MATERIALS: (PL-100, 101, 102, 103—PL-200, 203)

History, Properties — End uses — Methods of manufacture — Processes.

(a) Engineering Thermoplastics: Acrylics, acetals, nylons and polycarbonates.

(b) Engineering Thermosets: Polyesters, phenolics and epoxies.

(c) Ingredients and reinforcements.

(d) Properties: Plastic characterization and identification, physical, mechanical, electrical, thermal, optical and environmental properties.

PROCESSES: (PL-110, 111, 112, 113—PL-210, 213)

Theory of processes: Machine design, Machine operation and set-up. Advantages and Limitations.

(a) Thermoplastic process: Processes, general. Extrusion. Blow moulding. Injection moulding. Thermoforming. Calendering.

(b) Thermoset processes: Process, general. Low pressure. Compression. Injection. Filament winding.

(c) Forming and Fabricating: Materials. Machining. Assembling. Tooling. Jigs and fixtures.

(d) Process equipment: Design and operation. Hydraulics. Heat transfer. Electricity and mechanics.

(e) Product testing: Industry standards, ASTM systems. Specifications.

DESIGN: (PL-120, 121, 122, 123—PL-220, 223)

(a) Product design.

(b) Mould manufacture and mould materials.

RELATED SUBJECTS:

(a) Polymer chemistry: Elements, compounds and mixtures. The atom. Simple organic compounds. Polymers. Composites.

(b) Plastics applied sciences: Electrics. Hydraulics. Mechanics. Rheology.

(c) Engineering Mathematics: Algebra. Logarithms. Trigonometry. Computer mathematics. Elementary statistics.

(d) Communications: Business correspondence. Reports —preparation and presentation. Public speaking and debating. Research—technical material resources. Contemporary authors.

(e) Industrial Management: Budgeting. Management of physical property. Plant organization, Production control. Cost control—process economics. Selling and merchandising.

(f) Blueprint reading.

"THERMOSETS" Tuesday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

"THERMOPLASTICS" Wednesday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

BASIC INSTRUMENTATION ELECTRONICS — C404 (Inst. 99*)

This course is designed primarily for pneumatic instrumentation personnel who wish to study the basic fundamentals of electronic instrumentation. The course consists of lectures, experiments and practical applications.

Course Content — Ohm's Law, Series and parallel circuits, test instruments, basic electron tube and transistor theory, thermocouples, potentiometric devices, wheatstone bridge, radiation and optical pyrometry, calibration and troubleshooting techniques.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

*Text book to be announced.

INSTRUMENTATION — C403 (Inst. 130, 131*)

Prerequisite — Applicant should be employed in Instrumentation or an associated field.

Course Content — Applied physics, pneumatic and electronic instruments, control theory and systems application, final control elements including valve sizing. Analysis equipment including speed, pH, humidity, chromatography, etc.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

*Texts to be announced.

BLUEPRINT READING — C170 (DR130)

The aim of this course is to provide tradesmen with a basic understanding of blueprint reading.

Freehand Sketching: Freehand sketching of simple and complex objects using multiview, isometric and oblique projections.

Blueprint Reading: Study of methods of representation of objects including orthographic multiview, isometric and oblique projection. Dimensions and tolerances, notes and specifications, surface finish. Auxiliary views, sections. Threads and fasteners. Gears and cams, simple developments. Detail and assembly drawings. Methods of reproduction of drawings.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

MARINE TECHNOLOGY

STATIONARY ENGINEERING 3rd & 4th CLASS

These courses are orientated towards the student's successful participation in the Department of Labour's examinations as outlined under the Operating Engineers Act.

Prerequisite — 19 years of age.

Course Content — Steam boilers including safety valves, water gauges and columns blowdown and scum valves, boiler construction, feed water admission treatment and conditioning, safe operation, maintenance and inspection.

Combustion: fuels, fuel burning and firing equipment and air supply.

Auxiliary equipments: feed water heaters, condensers, pumps, injectors and air compressors.

Refrigeration systems including safe operation and maintenance. Principles of electricity, operation and maintenance of motors, generators and transformers.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B. (Wed.)

STATIONARY ENGINEER 2nd CLASS

Prerequisite — 3rd Class.

Course Content—Steam boilers and accessories construction and maintenance with emphasis on operation repair and inspection and testing; combustion, fuels, heat transfer.

Refrigeration theory, operation, maintenance, repair and and inspection. Air compressors, types, principles and safe operation of systems.

Mathematical calculations relating to: boiler performance, fuel combustion, draft, refrigeration performance, boiler construction, electricity and pumps.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

ENGINES FOR YACHTSMEN

Prerequisite — Interest in all marine engines.

Course Content — Theory of the 2 and 4 stroke cycle engines. Construction of engine components, their functions and requirements; oil systems, cooling systems, starting motors, pumps and fuel systems.

Timing and adjustment of pump injectors. Thrust bearings and marine gear boxes, engine governors.

Care and maintenance, trouble shooting and winter lay up.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

CANADIAN POWER SQUADRON COURSES

In addition to the foregoing the College provides accommodation for courses offered by the Toronto Power Squadron. Registration for these courses will take place on Monday, September 23rd, from 7:30 p.m. to 9:30 p.m. at 37 Dartnell Avenue. Classes begin during the week of September 30th, with the exception of courses marked *, which begin one week later. All courses will end on the date set by the examination board, which will be announced. Further information may be obtained by telephoning the Toronto Power Squadron at: RU1-0005.

The courses offered are listed below. All classes Campus B.

PILOTING — $30. Available both Monday and Wednesday. Terminology — Equipment — Government regulations — Rules of the road at sea — Safety at sea — Mariner's compass — Aids of navigation — Charts and piloting — Manners and customs on board. Successful completion of this course qualifies a person for membership in Canadian Power Squadron and admission to other courses. Membership is open to men, women and and juniors (Under 18).

THE FOLLOWING ADVANCED COURSES ARE OPEN TO MEMBERS OF CANADIAN POWER SQUADRON

* SEAMANSHIP — $10. Handling small craft, both power and sail, marlinspike, elementary weather, adverse conditions, gear and equipment, problems.
  Tuesday

* ADVANCED PILOTING — $10. Advanced chartwork and methods of determining position. Leeway allowances, tides and currents. Elementary radio aids to navigation.
  Wednesday

* ENGINE MAINTENANCE — $10. Operating principles of marine engines, inboard and outboard. Electrical, fuel, lubrication and cooling systems. This course is designed to make boatmen more self-reliant, not to train engine mechanics.
  Monday

* MARINE ELECTRONICS — $10. Marine radio maintenance and communication procedures. Radio direction finding, radar, Loran and Consolan. Electronic marine aids and equipment. The course includes the requirements of the D.O.T. examination for the Restricted Radiotelephone Operator's license.
  Monday

* SAILING — $12.50. Terminology, rigging, points of sail, true and apparent wind, theory of sail action, bending, setting and care of sails. Some aspects of racing are also covered.
  Tuesday

* WEATHER — $10. The atmosphere, air masses, wind systems, causes of weather, observing and interpreting weather signs, elementary forecasting. The emphasis of this course is on short range forecasting for small boats at sea.
  Tuesday

* JUNIOR NAVIGATOR — $25. Open only to successful candidates in both Seamanship and Advanced Piloting. Introduction to deep-sea navigation using celestial techniques. Care and use of the sextant. Reduction of star sights to determine position. Elementary time, the sailings and pilot charts.
  Tuesday

* NAVIGATOR — $25. Open only to successful candidates in Junior Navigator. Coordinate systems, navigational astronomy, civil, solar and sidereal time, star identification, refined methods of sight reduction.
  Monday

Note: All course fees are subject to confirmation.

ADVANCED TECHNICAL EVENING COURSES 1968-69

●

Educational Programs

in

Technological Subjects

leading to

Provincial Certification

in

Electrical, Electronic, Mechanical

Instrumentation

Metallurgy

GENERAL INFORMATION

Advanced Technical Evening Courses will be offered in the subjects listed on the following pages.

The first term classes begin on September 30, 1968 and end on December 19, 1968. Second term classes begin January 6, 1969, and end on February 27, 1969. Classes will not be held on statutory holidays.

Theory courses will be 60 hours in length consisting of twenty (20) three (3) hour lectures. Technical and Science courses will be 60 hours in length consisting of forty (40) hour lectures and twenty (20) hour laboratory sessions.

REGISTRATION

Students should enrol in person on registration evenings. Counselling and personal interviews will be held during registration evenings of September 23, 24, and 25th between the hours of 7:30 p.m. and 9:30 p.m.

Registration at Campus as indicated below each subject.

Campus A — 21 Nassau Street

Campus B — 37 Dartnell Avenue

Campus C — 51 Teraulay Street

ADVANCED TECHNICAL EVENING CLASS PROGRAM

FOREWORD

The Advanced Technical Evening Class programs, established in 1952, have been revised several times. The main objective of the modifications which appear in this booklet is to increase the flexibility of the program by extending the number and variety of subjects offered to persons, presently employed, who wish to continue their education as part-time students. The following list and the chart on page 18 will illustrate the variety of purposes that the revised program may serve

1. to meet the requirements for Advanced Technical Evening Class certificates at one or more of the three levels,
2. to meet the requirements of the student who wishes to improve his knowledge in specific subjects even though he does not intend to complete the total requirements for a certificate. For example, an individual may wish to study one or more subjects which will be of immediate value in his present employment or he may wish to study individual subjects leading towards certification at a higher level in certification programs for technicians and technologists administered by associations such as the Association of Professional Engineers of Ontario,
3. to meet the requirements for the certificate awarded after successful completion of a one-year technical program in a college (page 49, note 2),
4. to meet the admission requirements to the second year (third semester) of a two-year technician program offered as a regular day-school program in a college of applied arts and technology (page 49, note 3),
5. to meet the admission requirements to the second year (third semester) of a three-year technology program offered as a regular day-school program in a college (page 49, note 4),
6. to meet the educational requirements for certification by the Association of Professional Engineers of Ontario as an engineering technician (page 49, note 5),
7. to meet the admission requirements to the third year (fifth semester) of a three-year technology program offered as a regular day-school program in college (page 50, note 1),
8. to meet the requirements for a two-year technician diploma of the regular day-school program in a a college (page 50, note 2),
9. to meet the educational requirements for certification by the A.P.E.O. as a senior engineering technician (page 50, note 3),
10. to meet the requirements for a three-year technology diploma of the regular day-school program in a college (page 50, note 1),
11. to meet the educational requirements for certification by the A.P.E.O. as an engineering technologist (page 50, note 2),

12. to permit a graduate of a two-year engineering technician program of a college or of a former institute of trades or Ontario vocational centre to meet the educational requirements for certification by the A.P.E.O. as an engineering technologist after completing further subjects at an appropriate level (page 52, note 4).

The relationship between the Advanced Technical Evening Class program and the certification program of the A.P.E.O. referred to above, has been established over a period of years. Shown on pages 54 and 55 of this booklet is a special program, developed in co-operation with the Chemical Institute of Canada, which meets the educational requirements at each of the three levels of certification. Other bodies such as the Association of Ontario Land Surveyors, the Ontario Association of Architects and the Ontario Institute of Certified Cartographers have established or are considering the establishment of similar certification programs.

REQUIREMENTS FOR ADMISSION

Grade 1 Certificate

The minimum entrance requirement is the Ontario Secondary School Graduation Diploma obtained after successful completion of any Grade 12 (Ontario) course, provided that the applicant has passed the mathematics and science subjects of grades 11 and 12, or has the equivalent standing from other provinces or countries.

Applicants over 19 years of age may be admitted provided that they have passed English, mathematics, and the science subjects of grades 11 and 12

(a) in the Ontario secondary school program, or

(b) in the Ontario Manpower Retraining program, or

(c) in an upgrading program offered in a college of applied arts and technology, or

(d) provided that they can submit evidence satisfactory to the college that they are potentially capable of benefiting from the instruction.

Grade 2 Certificate

Successful completion of the requirements for the grade 1 certificate or an equivalent qualification.

Grade 3 Certificate

Successful completion of the requirements for the grade 2 certificate or an equivalent qualification.

REQUIREMENTS FOR CERTIFICATES

Grade 1 Certificate (nine subjects)

A grade 1 certificate will be awarded to a student who completes successfully English I, mathematics I, physics I or mechanics I and six other subjects except English II.

NOTE:

1. Both physics I and mechanics I may be taken as two of the required nine subjects.
2. A student who completes successfully the requirements for a grade I A.T.E.C. certificate in subjects specified by a college may be awarded the appropriate certificate of the college.
3. A student who completes successfully a grade I A.T.E.C. certificate program in subjects specified by the college may be admitted directly to the second year of a cognate technician program offered by the college.
4. A student who completes successfully English I, mathematics I, mathematics II, physics I, mechanics I, general chemistry, electrical fundamentals, electronic fundamentals and technical drawing I or a similar grade I certificate program specified by the college may be admitted directly to the second year of a cognate engineering technology program in a college of applied arts and technology.
5. Mathematics I and physics I or mechanics I plus five technical subjects at any level are accepted as the educational requirement for certification as an engineering technician by the A.P.E.O. Normally four of the five technical subjects should be related to the area of specialization, mathematics II may be used as one of the technical subjects. Proposed deviations from the above requirements should be cleared with the A.P.E.O.

Grade 2 Certificate

A grade 2 certificate will be awarded to a student who completes successfully English II, mathematics II and four other subjects selected from those appearing under the heading "Subjects at the grade 2 and grade 3 certificate levels" shown on the following pages.

NOTE:

1. A student who completes successfully the requirements for a grade 2 A.T.E.C. certificate in subjects specified by a college of applied arts and technology may be admitted directly into the third year of a cognate technology program offered by the college. For this option the student must have completed successfully mathematics III.
2. A student who completes successfully the requirements for a grade 2 certificate in subjects specified by a college of applied arts and technology may be awarded the appropriate technician diploma of the college.
3. A student who completes successfully seven subjects, including English I and mathematics II, in addition to the seven subjects referred to in note 5, page 49 will meet the educational requirements for certification as a senior engineering technician with the A.P.E.O. provided that at least six of the total of fourteen subjects are selected from those appearing under the heading "Subjects at the grade 2 and grade 3 certificate levels" shown on the following pages. Normally five of the six subjects should be related to the area of specialization. Proposed deviations from the above requirements should be cleared with the A.P.E.O.

Grade 3 Certificate

A grade 3 certificate will be awarded to a student who completes successfully mathematics III and any five additional subjects selected from those appearing under the heading "Subjects at the grade 2 and grade 3 certificate levels".

NOTE:

1. A student who completes successfully the requirements for a grade 3 certificate in subjects specified by a college of applied arts and technology may be awarded the appropriate technology diploma of the college.
2. A student who wishes to meet the educational requirements for certification as an engineering technologist, may do so by selecting appropriate subjects at each of the three certificate levels of the A.T.E.C. program. The educational requirements for certification as an engineering technologist as published by the A.P.E.O. are included in the appendix. Students are advised to study these requirements carefully and to clear any deviations in their proposed programs with the A.P.E.O.
3. A student who is a member of O.A.C.E.T.T. and who proposes to use the technical report written for English II as the report for certification should submit, for approval, the topic and a one-page synopsis to the Registrar, O.A.C.E.T.T., 236 Avenue Road, Toronto 5, Ontario. After the report has been assessed by the instructor it should be submitted to the Registrar for approval of the technical content. The report must show a technical and mathematical depth of understanding of the selected topic. It is suggested that the instructor in English II should submit the topics and synopses, in one mailing, for all students who are members of O.A.C.E.T.T.
4. A graduate of an approved two-year engineering technician program offered in a college of applied arts and technology will meet the educational requirements for certification as a senior engineering technician by the A.P.E.O. A graduate wishing to complete the educational requirements for certification as an engineering technologist should write to the Association for details of the additional A.T.E.C. subjects which he will be required to complete.

Subjects at the grade 1 certificate level

SUBJECTS (Alphabetically)	RECOMMENDED PREREQUISITES (or the permission of the course director)
Air Conditioning I	
Architectural Drafting I	
Building Construction I	
Cartography I	
Construction Methods and Materials I	
Descriptive Geometry	Technical Drawing I
D.C. Machines	Electrical Fundamentals
Electrical Drafting	
Electrical Fundamentals	Mathematics I
Electronic Fundamentals	Electrical Fundamentals
English I	
Foundry Technology I	
General Chemistry	
Geology I	
Industrial Hydraulics	
Instrumentation I	
Legal Surveying	
Mathematics I	
Mechanical Installations I	
Mechanics I	Mathematics I
Minerology I	
Physics I	Mathematics I
Quantity Surveying I	Construction Methods and Materials
Refrigeration I	
Survey Computations and Drafting	
Surveying I	Survey Computations and Drafting Mathematics I
Technical Drawing I	
Welding Technology I	
Workshop Technology I	

Subjects may be added to the above list as the need arises. Requests by colleges for approval of additional subjects should be sent to the Director, Applied Arts and Technology Branch, Department of Education, 55 Eglinton Avenue East, and should be accompanied by a detailed course outline.

Subjects at the grade 2 and grade 3 certificate levels

SUBJECTS	RECOMMENDED PREREQUISITES (or the permission of the course director)
English II (Report)	English I
Mathematics II	Mathematics I
Mathematics III	Mathematics II
Mathematics IV	Mathematics III
(a) Advanced Calculus	Mathematics III
(b) Numerical Methods and Digital Computations	Mathematics III
(c) Statistics I	Mathematics II
Economics	
Industrial Management	
A.C. Circuits	Electrical Fundamentals Mathematics II
Computer Control	Electronic Fundamentals Mathematics IV
Electrical Control Systems I	A.C. Circuits Electrical Equipment
Electrical Control Systems II	Electrical Control Systems I Mathematics IV
Electrical Equipment	A.C. Circuits
Electrical Measurements	A.C. Circuits
Electronic Circuits	Electronic Fundamentals
Industrial Electronics	Electronic Fundamentals Electronic Circuits
Power Systems	A.C. Circuits Electrical Equipment
Boolean Algebra and Digital Computers	Mathematics III
Communications	Electronic Circuits and Mathematics IV
Communications Systems	Communications Networks Pulse Circuits
Computer Technology	Boolean Algebra and Digital Computers Pulse Circuits
Electronic Circuits	Electronic Fundamentals and A.C. Circuits
Electronic Instrumentation	Pulse Circuits
Electronic Systems	Pulse Circuits
Feedback Control Systems	Computer Technology
Pulse Circuits	Electronic Circuits Mathematics IV
Solid State and Component Technology	Physics I Electrical Fundamentals
Data Processing	Introduction to Computers Numerical Analysis
Electrical Systems	Electrical Fundamentals
Industrial Organization	
Industrial Psychology	
Industrial Relations	
Introduction to Computers	Mathematics I
Machine Design	Mechanics of Materials I Mechanics II Technical Drawing

Management Accounting	Mathematics I
Statistics II	Statistics I
Mechanics II	Mechanics I Mathematics III
Metrology	Mathematics I Technical Drawing Statistics I
Operations Research	Mathematics III
Plant Layout and Materials Handling	Mathematics I
Production Control	Statistics I
Quality Control	
Systems and Procedures	
Tool Design I	Mechanics of Materials I
Value Engineering	
Wage and Salary Administration	
Work Study	Mathematics I
Foundry Technology II	Foundry Technology I
Mechanics of Fluids	Mechanics II Mechanics I Mathematics II
Mechanics of Materials I	Mechanics of Materials I Mathematics III
Mechanics of Materials II	General Chemistry Mechanics II Physics I Mathematics III
Metallurgy	Workshop Technology I Mathematics III
Theory of Machines	Mechanics II
Thermodynamics	
Workshop Technology II	Mechanics of Materials II Mechanics of Materials I Mechanics of Materials II
Mechanics of Fluids (Civil Technology)	Mechanics of Materials II Mechanics of Materials II Mechanics of Materials II
Soil Mechanics and Foundations	Mechanics of Materials II Mechanics of Materials II Mechanics of Materials II Mechanics of Fluids Surveying and Mathematics II
Construction Materials	Surveying and Mathematics II
Theory of Simple Structures	
Technical Drawing (Civil)	
Structural Design in Reinforced Concrete	
Structural Design in Steel	
Structural Design in Timber	
Sanitary Technology	
Highway Technology	
Photogrammetry and Air Photo Interpretation	Surveying I Mathematics II
Welding Technology (Civil)	Refrigeration I Air Conditioning I Technical Drawing I Quantity Surveying I Mechanical Installations I Tool Design I Building Construction I Survey Computations and Drafting I Construction Methods and Materials I Instrumentation I Mathematics I Physics I Instrumentation II
Surveying II	
Refrigeration II	
Air Conditioning II	
Technical Drawing II	
Quantity Surveying II	
Mechanical Installations II	
Tool Design II	
Building Construction II	
Survey Computations and Drafting II	
Construction Methods and Materials II	
Instrumentation II	
Instrumentation III	

Cartography II	Cartography I
Legal Surveying	
Architectural Drafting II	Architectural Drafting I
Geology II	Geology I Physics I
Minerology II	Minerology I Physics I

Subjects may be added to the above list as the need arises.

SYLLABUS FOR CHEMICAL ENGINEERING TECHNOLOGY

The Committee on Certification of Chemical Technicians sponsored by the Chemical Institute of Canada has accepted the Advanced Technical Evening Class program in Chemical Technology as meeting the educational requirements for certifying Chemical Technicians and Technologists.

The certification is as follows:

Grade I A.T.E.C. certificate—Assistant Chemical Technician

Grade II A.T.E.C. certificate—Chemical Technician

Grade III A.T.E.C. certificate—Chemical Technologist

SUBJECTS	RECOMMENDED PREREQUISITES (or the permission of the course director)
English I	
Mathematics I	
Mathematics II	Mathematics I
Physics I	Mathematics I
Electrical Fundamentals	Mathematics I
General Chemistry	
Organic Chemistry I	General Chemistry
Inorganic Chemistry I	General Chemistry
Physical Chemistry I	General Chemistry and Mathematics I
Electronic Fundamentals	
English II (Technical Report)	English I
Mathematics III	Mathematics II
Mathematics IV (one of the following)	
(a) Advanced Calculus or	Mathematics III
(b) Numerical Methods and Digital Computation or	Mathematics III
(c) Statistics I	Mathematics II
Chemical Physics	Physics I and Mathematics III
Organic Chemistry Laboratory	Organic Chemistry I
Physical Chemistry II	Physical Chemistry and Mathematics IV
Physical and Instrumental Methods Laboratory	Physical Chemistry I, Electrical Fundamentals, and Mathematics IV
Quantitative Inorganic Analysis Laboratory	Inorganic Chemistry, Physical Chemistry I, Organic Chemistry I, and Mathematics III

Chemical Engineering Principles	Inorganic Chemistry and Physical Chemistry II
Industrial Chemical Processes	Inorganic Chemistry, Organic Chemistry I, and Physical Chemistry II
Organic Chemistry II	Organic Chemistry Laboratory, Inorganic Chemistry, and Mathematics III

GENERAL INFORMATION

CREDITS

1. Credits toward a certificate, based on previous qualifications, may be established by the college. These credits do not become effective until the student completes the requirements for a certificate.
2. An applicant for credit must supply adequate proof that he has completed satisfactorily a study of the subject or subjects for which he expects credit.
3. A maximum of six credits only may be allowed toward the grade 1 certificate, and four only for each of the grade 2 and grade 3 certificates.
4. Credits in subjects that have been deleted in this booklet will be honoured in determining eligibility for A.T.E.C. certificates.
5. The following credits may be allowed on presentation of proof of standing in the grades 11, 12 or 13 subjects shown in the following list:

   English I: Grade 13 English Composition

   Mathematics I: Grade 13 Algebra, Trigonometry and Statics

   Mathematics II: Grade 13 Algebra, Trigonometry and Statics and Geometry

   Physics I: Grade 13 Physics, or Grades 11 and 12 Industrial Physics as the technical subject

   General Chemistry: Grade 13 Chemistry, or Grades 11 and 12 Industrial Chemistry as the technical subject

   Electrical Fundamentals: Grades 11 and 12 Electricity as the technical subject

   Electronic Fundamentals: Grades 11 and 12 Electronics as the technical subject

   Technical Drawing: Grades 11 and 12 Mechanical Drafting as the technical subject

   Workshop Technology: Grades 11 and 12 Machine Shop as the technical subject.
6. Grade 12 graduates of the five-year program of the Science, Technology and Trades Branch of the secondary school program may be allowed one credit in the technical subject in which they specialized in grades 11 and 12.
7. In special cases such as those listed below, where assessments are difficult, the college
   1. may require the applicant to write a qualifying examination,

      or

   2. may permit the applicant to take another subject for which the subject under assessment is a direct prerequisite. If the student is successful in the advanced subject, he will be granted credits in both the advanced subject and its direct prerequisite. If there is doubt concerning a credit in Mathematics I, for example, a pass in Mathematics 2 would establish credits in both Mathematics I and 2.

   Examples of special cases:

   Students who have attended other evening courses of at least 50 hours' duration;

Students who have completed correspondence courses of at least 100 hours' duration;

Students who are over 22 years of age and have had at least three years' industrial experience related to the subject in which credit is desired.

STANDARDS

The instructional time for each subject must be at least 50 hours exclusive of final examinations. Regular tests and examinations are a part of the course in each subject. The passing grades should be comparable to those established by the college for the regular day school programs. With the approval of the course director, any book listed as a reference text in the course outline or any book used in a similar day school subject may be used as the text book in the subject.

Course outlines have been prepared for the subjects listed in this booklet. It is suggested that these outlines be interpreted by the instructor to suit the special requirements of particular classes.

PREREQUISITES

It is the responsibility of the director to ascertain that a student has completed the necessary prerequisites before admitting him to classes in any subject of the course.

ASSIGNMENTS

During the instructional periods, the instructor should plan to use one-third to one-half of the time assisting with individual and class problems which arise. The instructor should also assign homework.

The length of time to be spent on this assignment should be approximately equal to that spent in the classroom. These assignments should be corrected and the marks recorded by the instructor.

ADMINISTRATION

The college is responsible for the administration of the program and for keeping permanent records of the students' progress and final results.

CERTIFICATES

When a student completes the requirements for a certificate the college should apply, on the form provided, to the Director, Applied Arts and Technology Branch, Department of Education, for the appropriate certificate.

If a student completes an A.T.E.C. program, evaluated by the college, as equivalent to its regular day-school program, it is recommended that the college award its regular day school diploma.

ENQUIRIES

Applications for further information should be addressed to the Director, Applied Arts and Technology Branch, Department of Education, 55 Eglinton Avenue East, Toronto 12, Ontario.

A-T.E.C.

SYLLABUS OF SUBJECTS

ENGLISH 1 — CT100 (ENG 100, ENG 141)

The purpose of the course is to assist the student to express himself in simple, clear, correct English. The course will include a quick review of grammatical errors, development of vocabulary, precis writing, report writing, business letters, parliamentary procedure for meetings, e.g. a business meeting, a club meeting, an organizational meeting, etc., also a discussion of the various types of literature such as the novel, drama, poetry, essay and short story, their purpose, their place and their contribution to our society.

Thursday — 7:30 p.m. to 10:00 p.m. 60 hrs. Campus C.

ENGLISH 2 — CT101 (ENG 200, ONE SEMESTER)

Prerequisite — English 1.

The aim of the course is to enable the student to use the English language with greater skill, facility and precision.

The course will include various types of business letters, such as letters of enquiry, reply, complaint, adjustment, collection and appeal, various types of reports and report writing, the use of charts, tables and graphs, public speaking, which will include voice training, argument, discussion, improvement of reading techniques and memory training.

Wednesday—7:30 p.m. to 10:00 p.m. 60 hrs. Campus C.

PRE-ADVANCED TECHNICAL MATHEMATICS — CT112 (MATH 130)

Review of Grade 11 and 12 mathematics to include arithmetic fundamentals, mensuration of areas and solids of various sizes and shapes with practical examples; algebra — index laws, equation of first degree and second degree, factoring, powers of quadratics, logarithms, surds; slide rule, geometric constructions, the right angle triangle, Pythagorean Theorem, geometric proof for the common theorems involving lines, triangles, circles, arcs, and segments; trigonometry — the right-angled triangle, reciprocal ratios, complementary ratios; basic trigonometry formulae to include derivation and practical application.

Wednesday—7:30 p.m. to 10:00 p.m. 60 hours Campus A.

MATHEMATICS I — CT113 (MATH 100)

Prerequisite — Grade 12 Mathematics or equivalent.

Computations with measured quantities: exact and approximate numbers, scientific notation, analysis of error, slide rule and tables.

Algebra: Linear functions, systems of linear functions, determinants, quadratic functions.

Logarithms: logarithmic and exponential functions, applications.

Trigonometry: trigometric functions, application to mechanical and electrical problems.

Series and progressions.

Analytical Trigonometry: complex numbers, vector algebra.

Thursday — 7:30 p.m. to 10:00 p.m. 60 hrs. Campus C.

MATHEMATICS II — CT114 (MATH 200)

Prerequisite — Mathematics I or equivalent.

Binomial theorem.

Notational Systems.

Analytic Geometry: the straight line, loci, conics, general second degree equations.

Differential Calculus: limits, the derivative slope, rate of change, maxima and minima of functions.

Graphical Analysis.

Integration: anti-differentiation, the indefinite integral, the definite integral, interpretation of the definite integral.

Tuesday — 7:30 p.m. to 10:00 p.m. 60 hrs. Campus C.

MATHEMATICS III — CT115 (ATEC — no equivalent)

Prerequisite — Mathematics II or equivalent.

Differential calculus — functional notation, gradients, limiting value, differentiation from first principles; maxima and minima; diffcrentiation of products and quotients, of trigonometric functions, with applications to angular velocity and acceleration, simple harmonic motion, and electrical problems. Intcgral calculus — relationship between differentiation and integration; the definite integral areas; volumes by integration; integration by trigonometric functions; centre of gravity and centroids with applications; application of calculus to problems encountered in industry and in related subjects.

Monday — 7:30 p.m. to 10:00 p.m. 60 hrs. Campus C.

MATHEMATICS IV — CT116 (SPECIAL)

Prerequisite — Mathematics III or equivalent.

Differentiation of exponential and logarithmic functions —Application to engineering problems.

Moments of inertia, radius of gyration; second moment of area.

The rod, rectangle, disc and cylinder.

Parallel axis theory; perpendicular axis theory.

Review centre of gravity and centroids: Theorems of Pappers.

Standard methods of integration, such as substitution, trigonometric identities, partial fractions and parts.

Radius of curvature; lengths of curves.

Expansion in series; Mac Laurin's Theorem.

Differential Equations — Simple differentiation equations of the first and second order.

Complex Numbers — This subject should be included as required for those students specializing in Electrical or Electronic Technology.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

MECHANICS OF MATERIALS I — CT127 (MECH-110)

Prerequisite — Mathematics II and Mechanics I.

Mechanical properties and testing; unit stress and strain; beam type members — statically determinate; beam type member design; deflection due to bending; thin cylinders and joints; resilience; torsion; combined stresses.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

MECHANICS OF MATERIALS II — CT128 (SPECIAL)

Prerequisites — Mechanics of Material I & Mathematics III.

Course Content — Fatigue and stress concentration, statically determinate members, statically indeterminate members, properties of materials, columns, combined stresses, thick walled and compound cylinders.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

MODERN PHYSICS — CT129 (PHYS 200)

Prerequisites — Mathematics III & Physics I.

Course Content — **Electro Magnetism:** Electrostatics, Electromagnetics, Charged Particle Ballistics, Electromagnetic Waves and Spectrum.

Atomic Physics, Periodic Table (Physical point of view), Emission and Absorption of Radiant Energy, Early structure of an atom, Quantum Theory, Waves or Particles, Bohr Atom and Line Spectra, Modern Atomic Model and Schroedinger Wave Equation.

Physics of the Solid State — Crystaline Solids, Experimental methods of Determining Crystal Structure, Classification by structure, Classification binding Energy Displayed, Electronic Structure of Solids.

Structure and Behaviour of Metals.

Structure and Behaviour of Semi conductors.

Semiconductor Devices.

Nuclear Physics.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

GENERAL CHEMISTRY — CT165 (CHEM 100)

METHODS OF CHEMISTRY: physical and chemical changes, chemical terminology.

ORGANIC CHEMISTRY: structure and reactions of common aliphatic groups.

STATES OF MATTER: gas laws, partial pressure.

NUCLEAR CHEMISTRY: basic nuclear particles, isotopes, radioactivity, half life, radio-isotopes and uses.

EQUILIBRIUM: rate of reaction, reversibility, Le Chatelier's Principle, equilibrium constants, solubility as an equilibrium process, methods of expressing solubility and concentration, ion exchange.

ACIDIMETRY AND HYDROLYSIS: definitions, pH, indicators, titra; ions, relation to oxidation and reduction.

ELECTROCHEMISTRY: electrolysis, Faradays Law, electro-chemical series, corrosion.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

BUSINESS LAW — CT104 (SPECIAL)

A summary of our laws of contract, employment, agency, sales of goods, Insurance, bailments, real estate, negotiable instruments, partnerships, Corporation, bankruptcy, trade marks, business crimes and tests.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

INDUSTRIAL PSYCHOLOGY — CT105 (SPECIAL)

The aim of this course should be to help students understand human behaviour. The following topics should be studied and discussed; learning theory, motivation, emotion, perception, personality theory; psychological measurement.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

INDUSTRIAL RELATIONS — CT106 (SPECIAL)

A brief history of labour unions in Britain and North America; an examination of labour's philosophies; a description of structure of labour organizations; a review of current problems of unions; exploration of the relationships between labour and politics, labour legislation in Ontario; the structure of the Canadian labour market, income theory; and human relations in industry.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

PHYSICS I — CT124 (PHYS 100)

Prerequiste — Mathematics I or equivalent.

Properties of matter, mechanics — force, motion, speed, velocity, acceleration, projectiles, momentum, simple machines, work, friction, elasticity; heat — temperature measurements, heat transfer, expansion, heat units, latent and super heat, working of sound waves; light — intensity, inverse square law, speed of light; ray optics; wave optics, including lenses, interference, diffraction and polarization.

Tuesday—7:00 p.m. to 10:00 p.m. 60 hours. Campus C.

ECONOMICS — CT128 (EC 100)

Introduction; Basic economic problems, supply and demand; business units; personal finances; money and banking; labour, international trade; business cycles and national accounts; social services.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

TECHNICAL DRAWING — CT164 (DR 100)

An introduction to drawing — office practice. It includes basic instruction about instruments, lettering lines, applied geometry; third-angle orthographic projection; isometric projections; freehand sketching; conventions; sections; dimensioning; tolerances; simple working drawings; fasteners; gearing; transmission units; pipe fittings and layouts; electrical drawing of simple and the more intricate circuitry, electrical symbols.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

DESCRIPTIVE GEOMETRY — CT165 (DR 120)

Prerequisite: Technical Drawing or Equivalent.

Problems of engineering design in the general areas of mechanical engineering, civil engineering, and architecture may often be quickly solved by the use of orthographic projection. Descriptive geometry is really very advanced orthographic projection, and enables the student to visualize a problem where more than the traditional three views is involved. Visualization based upon logical conclusions which have been derived from observation and analysis, is a principal aim of this course. The application of descriptive geometry principles to practical problems is the final objective. The course will include; multiview engineering drawings, space relationships, auxiliary views, points and lines, true length of oblique lines, parallel lines, intersecting lines, perpendicular lines, true size of oblique plane surfaces, edge views, slope of a plane, intersection of a line and a plane, location of a figure on a plane surface, dihedral angles, revolution methods to find the true length of lines and the true shape of surfaces, counter-revolution, single curved surfaces, intersection of two plane surfaces, intersections involving planes, cones, and cylinders.

Text — Technical Descriptive Geometry by Wellman.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

ELECTRICAL FUNDAMENTALS — CT190

Prerequisite — Mathematics I.

Basic electrical concepts; simple D.C. circuits; power; magnetism, electromagnetism; magnetic circuits; D.C. measuring instruments; A.C. measuring instruments; electrical measurements; induction; capacity; alternating current, reactance, impedance, power in A.C. circuits.

Monday — 7:00 p.m. to 10:00 p.m. 60 hours. Campus A.

ELECTRONIC FUNDAMENTALS — CT209 (ELTC-100)

Prerequisite — Electrical Fundamentals and Mathematics II.

Atoms, electrons and current flow; two-element electron devices; three-element electron devices; multigrid tubes; special transistors; auxiliary components in electric circuits. A.C. circuits in electronic decibels and sound, rectifiers; the vacuum-tube amplifiers, the transistor amplifier.

Monday — 7:00 p.m. to 10:00 p.m. 60 hours. Campus C.

MECHANICS 1 — CT125 (MECH 100)

Prerequisite — Mathematics I or equivalent prior to or concurrent with Mechanics 1.

Statics — Basic principles of statics; coplanar parallel and concurrent force systems; friction; centroids and centres of gravity; second moments of areas. Dynamics — basic principles, rectillinear motion work, energy and power; impulse, momentum, impact.

Monday — 7:00 p.m. to 10:00 p.m. 60 hours. Campus C.

MECHANICS 2 — CT126 (MECH 200)

Prerequisite — Mechanics 1 and Mathematics III.

Statics — Review of force systems — coplanar non-coplanar parallel, non-coplanar concurrent, non-coplanar non-current force systems; friction. Dynamics — relative velocity; torque, angular motion and energy; motion in a circular path; simple harmonic motion; pressure of liquids; flow of water.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

TOOL DESIGN — CT173 (MECH 201)

Prerequisite — Technical Drawing, Mechanics of Materials.

Tolerances and allowances. Common tool construction steels. Tool drafting and dimensioning. Jig and fixture components. Design procedure and analysis — Design assignments.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

QUALITY CONTROL — CT174 (SPECIAL)

Prerequisites — Mathematics III, Mechanics of Materials II.

Course Content — SQC techniques, control for acceptance, control for quality. Designed experiments, reliability, customer complaints, reports. Organization for quality control.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

SOIL MECHANICS AND FOUNDATIONS — CT175 (Co 100)

Prerequisites — Mechanics of Materials II.

Course Content — Classification of soils, weight-volume relations, compaction of soils, permeability, the principle of effective stress, shearing strength of Cohesionless soils, shearing strength of clayey soils, Origin of soils, soil exploration, spread botings — bearing capacity, consolidation, pile foundations, caissons, stability of slopes, lateral earth pressures.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

CONSTRUCTION MATERIALS — CT176 (Co 103A)

Prerequisite — Soil Mechanics and Foundations.

Course Content — Specifications and contracts related to construction, aggregates, cement, elements of quality concrete, ACT method of concrete mix design, special concretes and concrete admixtures. Manufacture and effective utilization of concrete, field problems, soil cement stabilization, introduction to asphalts, bituminous pavements, asphalt mixtures, aggregates for Asphalt Concrete, Asphalt concrete mix design; production, construction, field control of asphalt.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

SURVEYING — CT177 (SURV 100A)

Prerequisite — Mathematics I.

Course Content — Importance of surveying, correction for measured distances, use of simple distance measuring equipment.

Measurements of angles—with transit; Differential trigonometric, profile and cross-section levelling, Type, adjustment and use of levels — problems.

Methods of stadia — problems; Topographical surveys contour lines; Direction of line, magnetic Meridian and declination, isogonic chart, azimuth and bearing of a line — traverse surveys and computations, closing a traverse by latitudes and departures, Traverse computations, error of closure, coordinates, area by double meridian distance — problems, preparations of topographic map — construction surveys, municipal surveys, grades, methods of setting grades — horizontal circular curves, theory, computations, field practise — demonstration of modern survey equipment.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

ELECTRICAL EQUIPMENT — CT191

Prerequisite — Electrical Fundamentals.

Introduction to electrical equipment; construction of direct current motors and generators; direct current generator principles; direct current generator characteristics; direct current motor principles; direct current motor characteristics; parallel operation of generators; synchronous motors; polyphase induction motors; single phase induction motors.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ALTERNATING CURRENT CIRCUITS — CT192 (ATEC SPECIAL)

Prerequisite — Electrical Fundamentals and Mathematics III.

Inductance; capacitance; alternating current fundamentals; R, L, and C in A.C. circuits; series A.C. circuits; parallel A.C. circuits; series resonance; parallel resonance; vector loci analysis; network theorems; coupled circuits and transformers; polyphase circuits; non-sinuscidal waves.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

INSTRUMENTATION I — CT430 (INST 101)

Prerequisite — Mathematics I.

Introduction; pressure measurements—manometers; dead weight tester; primary elements; installation of pressure measuring systems. Temperature—bulb filled systems and glass stem thermometers, cubical expansion of liquids, properties of glasses, manufacture, calibration and uses of liquid thermometers, mercury systems, vapour pressure systems. Flow measurements — elements of fluid flow, sharp edged orifices, ventura tubes, flow nozzles, pitot tubes, pitot ventura tubes, piping arrangements, calibration of meters. Liquid level measurement — gauge glasses, float instruments, dropped leg manometers, dry manometers. Flow plan and blueprint reading.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

INSTRUMENTATION II — CT431 (INST 102)

Prerequisite — Instrumentation I & Electronics I (New Course) — Thermoelectric pyrometry — automatic control — control valves — analysis equipment.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRICAL MEASUREMENTS — CT193 (SPECIAL)

Prerequisites — Electrical Fundamentals.

Course Content — Principles of Measurement, The D'Arsonval Meter Movement, D.C. Ammeters, D.C. Voltmeters, A.C. Voltmeters and Ammeters, Power Measurements. Instrument Transformer Use — The Ohmmeter, Multimeters — Vacuum Tube Voltmeters — Secondary Standards — Precision Measurement of Resistance — Voltage & Current — A.C. Bridge Circuits — Oscilloscopes — Oscilloscope Accessories — Audio frequency and Signal Generators, Magnetic Measurements — transducers — Indicating and Registering Equipment.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRICAL CONTROL SYSTEMS I — CT194 (SPECIAL)

Prerequisites—Alternating Current Circuits & Electrical measurements.

Course Content — Outline limitations of Manual control advantages of Magnetic control systems, Relays and Contractors — Magnetic Structure, contact structure, coil requirements, Control Accessories — Time delay relays, Switches, Amplifiers.

Basic Relay Circuits — Design of simple control circuit, analysis of control circuits, sequence diagrams.

Direct Current Motor Operation — speed-torque curves, load characteristics, performance curves, (series motors), peformance curves for generators, stability, shunt motor operation, compound motors.

Basic Direct Current Control Circuits — line starting, push button start circuits, jogging circuit for line start, reversing, series resistance starting, field acceleration, armature shunting, dynamic braking circuits, plugging circuits alternating current motor control — modes of acceleration, primary resistance starting, primary reactance starting, Star-Delta starting, Autotransformer starting, Synchronous motor starting, Resistor calculations — types of resistor.

Materials, current capacity, application data. Solenoids and Brakes — function, types, determination of size, calculation of deceleration time, typical brake data.

Speed Control — typical requirements, characteristics of speed control system, Rheostatic control of DC shunt motors, Rheostatic control of wound rotor Motors, Multi-speed motors.

Speed Control With Auxiliary Power — adjustable Voltage meters, adjustable speed drives for induction motors.

Static Control System—Advantages, Magnetic amplifier control, transistorized units.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

POWER SYSTEMS — CT196 (SPECIAL)

Prerequisites — A.C. Circuits.

Course Content — Power Transmission and Control, hydraulic generating stations, thermal generating stations, Economics of power systems. Single diagrams, Generating and transformer stations, Transmission and Distribution systems, Protective Relaying, Power Line Carrier Communications, Metering.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ELECTRONIC CIRCUITS — CT210 (SPECIAL)

Prerequisites — Electronic Fundamentals.

Course Content — Transformers and Transformer-coupled amplifiers, Resistance-Capacitance Coupled amplifiers, Special amplifiers, push-pull and phase inversion, Class C Amplifiers, Feedback, Feedback Oscillators, Negative-resistance Oscillators, Miscellaneous sine-wave oscillators, Modulation, detection, audio elements.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

PULSE CIRCUITS — CT211 (ELTR 200)

Prerequisites — Electronic Circuits & Mathematics IV.

Course Content — C.R. Wave Shaping Circuits, LR Shaping Circuits, Diode Clippers or Limiters, Diode Clampers (D.C. Restorers), Triode Squarer Circuit, Bistable Multivibrator, Schmitt Trigger Circuit, One Shot Multivibrator, Plate Coupled Multivibrator, Cathode Coupled Multivibrator, Thyrothon, Sawtooth Oscillator, Discharge Tube Time Base Circuit, Miller Time Base Circuits, Blocking Oscillator, Binary and Decimal Binary Counter.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

ELECTRONIC SYSTEMS I — CT212 (ELTR 202)

Prerequisites — Pulse Circuits.

Course Content — A. Monochrome Television Systems. Methods of visual representation, scanning and synchronization, analysis of one frame, synchronization and sweep circuits, cathode ray tubes, Television transmission and reception, the Video signal, video-amplifiers — wide band amplifiers, Television cameras.

B. The Oscilloscope.

Input circuits, plate loaded amplifiers, delay lines and distributed amplifiers, time-base generators, horizontal deflection systems, block diagrams.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus C.

INSTRUMENTATION TECHNIQUES — CT432 (INST 200)

Prerequisite — Instrumentation I & Instrumentation II

Overhauling and process tuning of controllers and final control elements under production conditions, advanced techniques using simulators.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

ANALYTICAL PROCESS INSTRUMENTATION — CT434 (INST 202)

Prerequisites — Instrumentation I & Instrumentation II

Process analyzers discussed in detail, combustion, moisture, gas chromotography, ultra-violet and infra-red analyzers, PH conductivity and oxidation reduction.

Wednesday—7:00 p.m. to 10:00 p.m. 60 hrs. Campus A.

METALLURGY — CT530 (SPECIAL)

Prerequisites — General Chemistry.

Production of iron and steel — direct reduction processes — alloy constitution diagrams Fe3C system — heat treatment — physical metallurgy — alloy steels — non-ferrous metals — physical testing.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

METROLOGY — CT531 (METR 100)

Prerequisites — Mathematics II and Technical Drawing.

History and principles — basic instrumentation — dial gauges and test indicators — surface plates — Micrometers and verniers — gauge blocks — optical instruments and testing — surface finish — screw thread and gear measurement — angular measurement — fixed gauges — air gauges — autometrology.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

THERMODYNAMICS — CT532 (SPECIAL)

Prerequisites — Physics I & Mathematics III.

Gas Laws, energy and continuity principles, gas and vapour properties; basic expansion and compression processes and cycles; air compression, refrigeration systems and cycles, fuels and combustion, heat transfer, heat transfer equipment, steam and gas turbine theory, mixtures of gases and vapours.

Thursday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

MECHANICS OF FLUIDS — CT533 (SPECIAL)

Prerequisites — Mathematics III and Mechanics II.

Introduction and Definition of Properties of Fluids, Principles of hydrostatic pressure, hydrostatic pressure on surfaces; relative Equilibrium of liquids, fundamentals of fluid flow; Orifices, nozzles, wires, pipes; fundamental principles of hydrodynamics.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

WORKSHOP TECHNOLOGY — CT600 (SPECIAL)

Prerequisite — A.T.E.C. level.

Review of basic manufacturing processes — Metal cutting — precision measurement and inspection — centre, capstan and turret lathes — horizontal and vertical mills — surface and cylindrical grinders — jig boring, broaching, diesinking, centreless grinding — electro-discharge and electro-chemical machinery numerical control.

Monday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

TOOL DESIGN EVENING CLASS PROGRAM

An evening student may study individual courses or he may complete a prescribed program of courses as credits toward a diploma as a Tool Design Technician.

Details of the program are shown in the 1968/69 day calendar and in the Tool Design Technician brochure.

For information purposes only, the outlines of Tool Design courses are shown on following pages. To enable prospective students to plan their own study programs, the following courses will be offered during the noted evening sessions:

	1968/69	1969/70	1970/71
Machining Jigs	*		*
Machining Fixtures	*	*	
Assembly Jigs and Fixtures		*	*
Tool Layouts, Tool and Gauge Design			*
Die Design — Cutting	*		*
Die Design — Bending and Forming	*	*	
Die Design — Drawing		*	*
Die Design — Plastic Mold and Die Design			*
Process Engineering		*	*

The objectives of the evening class program are:

1. To provide courses in specific skills.
2. To provide the opportunity for extension students to complete specified programs which are offered to full-time or part-time students.

An evening student can qualify for a certificate in Machine Shop Practice or for a diploma as a Toolmaking Technician. The specified certificate and diploma programs are outlined in the Day Calendar for 1968/69.

Evening Machine Shop and Toolmaking Courses are identical to day courses in the particular areas of study.

Identical grade points credits are allowed to successful students. Since most evening students work in the areas to which courses are directed, credit is allowed for this experience and some evening courses are thus shorter than their day equivalents. A student who has not had industrial machining experience may be required to take relevant courses.

MACHINING JIGS — CT601 (TD100)

Prerequisite — Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience, or courses.

Freehand sketching and machine drafting of jig designs, emphasizing current production methods and organizations.

Monday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

MACHINING FIXTURES — CT602 (TD101)

Prerequisite — Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience, or courses.

Freehand sketching and machine drafting of fixture designs, emphasizing current production method and organizations.

Tuesday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

ASSEMBLY JIGS & FIXTURES AND WELDING FIXTURES — CT603 (TD102)

Prerequisite — Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience, or courses.

Freehand sketching and machine drafting of assembly jigs and fixtures and welding fixtures, emphasizing current production methods and organizations.

7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

TOOL LAYOUTS, CUTTING TOOL DESIGN AND GAUGE DESIGN — CT604 (TD103)

Prerequisite — Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience, or courses.

Freehand sketching and machine drafting of tool layouts, cutting tool and gauge designs, emphasizing current production methods and organization.

7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

DIE DESIGN (CUTTING SHEET METAL)—CT605 (TD200)

Prerequisite — Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience, or courses.

Freehand sketching and machine drafting or blanking, piercing and cut-off dies.

Tuesday — 7:00 p.m. to 10:00 p.m. 120 hrs. Campus B.

DIE DESIGN (BENDING & FORMING SHEET METAL) — CT606 (TD201)

Prerequisite—Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience, or courses.

Freehand sketching and machine drafting of bending and forming dies.

Wednesday—7:00 p.m. to 10:00 p.m. 120 hrs. Campus B.

DIE DESIGN (DRAWING SHEET METAL) CT607 (TD202)

Prerequisite — Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience, or courses.

Freehand sketching and machine drafting of draw dies.

7:00 p.m. to 10:00 p.m. 120 hrs. Campus B.

BENCHWORK — CT610 (MACH 140)

This program is designed for people who wish to acquire basic skills and knowledge in benchwork, layout, measurement, drill press, bandsaw, and basic heat treatment. The use and care of hand tools such as hammers, files, hacksaws, and scribers, the application and care of precision instruments, including micrometers, vernier calipers and indicators. Layout work. General construction and operation of the drill press and bandsaw, safety precautions, methods of holding work on a drill press, drilling, sharpening, cutting lubricants, selecting and welding bandsaw blades, band filing. Forging, basic heat treatment, operation of furnace and quenching medium.

Monday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

LATHEWORK — CT606 (MACH 141A)

This program is designed for people who wish to acquire basic skills and knowledge in the operation of a lathe. General construction and operation of a standard engine lathe. Theory of lathe cutting tools, sharpening of tool bits, safety precautions, plain turning, knurling, drilling and boring, and counter-boring. Tapping on the lathe, form turning and taper work. Use of various attachments such as face plate, steady and follower rest and grinding.

Tuesday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

LATHEWORK (Advanced) — CT612 (MACH 141B)

This program is designed for people who have successfully completed lathework CT606 who wish to acquire advance skills in lathe, tracer-lathe, and turret lathe.

Taper turning, screw threading cutting, single and multiple start, eccentric turning, spring winding. The construction and operation of the tracer and turret lathe. Tools set-up; speeds and feeds, cutting lubricants.

Wednesday — 7:00 p.m. to 10:00 p.m. 90 hrs.
Campus B.

MILLING AND SHAPING — CT608 (MACH 142A)

This program is designed for people who wish to acquire basic skill and knowledge in Milling and Shaping.

Milling machine construction and operation of various types of milling machines, work holding devices, cutters and attachments, speeds, feeds, and safety precautions.

Shaper: Principal parts and operation. Cutting tools, clearance and rake angles. Machining surfaces and keyways with special attention to methods of holding work, safety precautions.

Tuesday — 7:00 p.m. to 10:00 p.m. 60 hrs. Campus B.

MILLING AND SHAPING — CT614 (MACH 142B)

This program is designed for people who have successfully completed Milling and Shaping (CT608) who wish to acquire advanced skills and knowledge in Milling and Shaping.

Theory of, and practise in, the use of the dividing head, with special attention to direct, plain, differential and

angular indexing gear theory, gear cutting, helical milling theory with special emphasis to mathematical problems in helical milling.

Shaping: Theory and practical work in special angles and dovetails.

Wednesday — 7:00 p.m. to 10:00 p.m. 60 hrs.
Campus B.

GRINDING — CT615 (MACH 143)

This course is designed for people who wish to acquire basic skills and knowledge in precision grinding.

Surface Grinding: Construction and operation, mounting wheels, methods of holding work, principles of magnetic chuck, demagnetizing, grinding work square. Use of sine-chuck for grinding accurate angles, safety precautions. Cylindrical grinder, principal parts and operation, internal and external grinding, parallel and taper grinding.

Tool and Cutter: Purpose, theory and practise in sharpening various cutters.

Thursday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

HEAT TREATMENT OF STEEL — CT616 (SPECIAL)

Steelmaking processes, carbon and alloy steels, common elements. Properties and uses of structural and tool steels.

Properties of iron and iron/carbon alloys. Phase diagram.

Annealing, normalizing, case hardening, carburizing, surface hardening, tempering, special treatments, hardenability. Furnaces and salt baths, quenching media and methods, atmospheres and flue gases, temperature measurement and control. Design/heat treatment relationship. Non-destructive testing and inspection.

Wednesday — 7:00 p.m. to 10:00 p.m. 90 hrs.
Campus B.

TOOLMAKING TECHNICIAN II

This prescribed program consists of five courses, each of which is of 90 hours duration when offered as part of the evening program. The courses are designed so that the student can apply the skills learned during the courses in Toolmaking Technician I. In addition, he will receive further training in more advanced applications of toolroom equipment and techniques.

Two courses only form the Toolmaking Technician II program which will be offered during the 1968/69 evening program. The following schedule will help the student plan his evening study program for the period 1968/71.

	1968/69	1969/70	1970/71
Jigs and Fixtures	T.*	*	
Production Techniques and Special Machines		*	*
Diemaking	M.*		*
Diemaking		*	
Diemaking			*

TOOLMAKING TECHNICIAN II

Prerequisite — Toolmaking Technician I program which consists of the following Courses:

CT605	CT606	CT607
CT608	CT609	CT610

JIG AND FIXTURES — CT617 (MACH 202)

Construction and operation of the following: templates, gap gauges, plug gauges, special gauges, drill jigs, milling fixtures, brazing and welding fixtures.

Thursday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

PRODUCTION TECHNIQUES AND SPECIAL MACHINES — C613 (MACH 203)

Machine engraving, jig boring, slotting, tracing lathe, tool and cutter grinding, turret lathe, E.D.M., E.C.M., numerical control.

7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

DIEMAKING — CT618 (MACH 204)

Punch press theory and operation, press brake theory and operation, theory, development, construction and operation of the following types of dies: cut-off, trim, pierce, blank, bending, forming, drawing, shaving, pierce and blank, compound.

Monday — 7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

DIEMAKING — CT619 (MACH 205)

Theory, development, construction and operation of the following types of dies: lancing, progressive, coining, embossing, cold forming, bulging, swaging, broaching, vacuum forming.

7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

DIEMAKING — CT620 (MACH 206)

Theory, development, construction and operation of the following types of dies: pierce, and blank, assembly, compound, subpress, extruding, curling, side cam, horn, moulds (Plastics and die cast).

7:00 p.m. to 10:00 p.m. 90 hrs. Campus B.

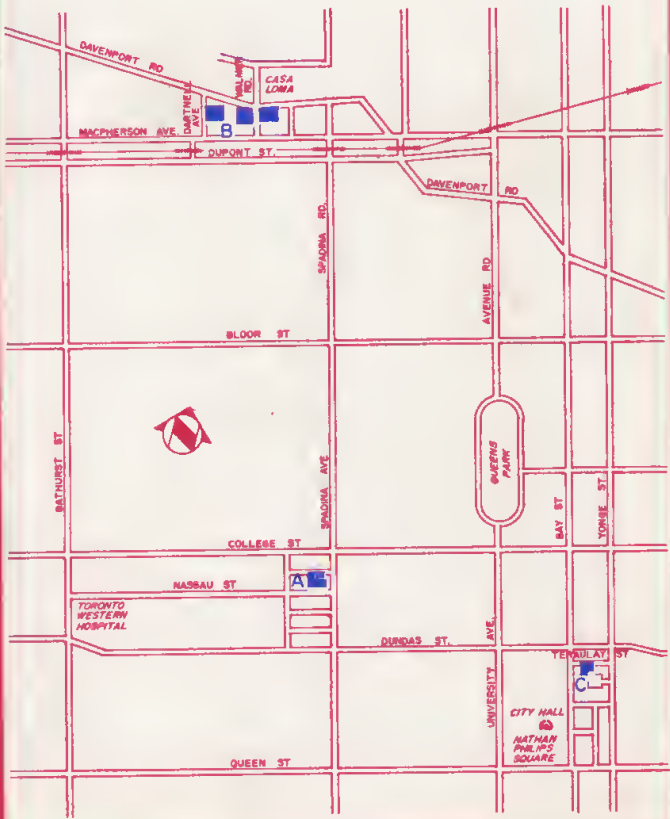
LOCATION PLAN

THE GEORGE BROWN COLLEGE
of applied arts and technology

A NASSAU STREET CAMPUS

B DARTNELL CAMPUS

C TERAULAY STREET CAMPUS



LOCATION

A 21 NASSAU STREET

B 37 DARTNELL AVENUE

C 51 TERAULAY STREET